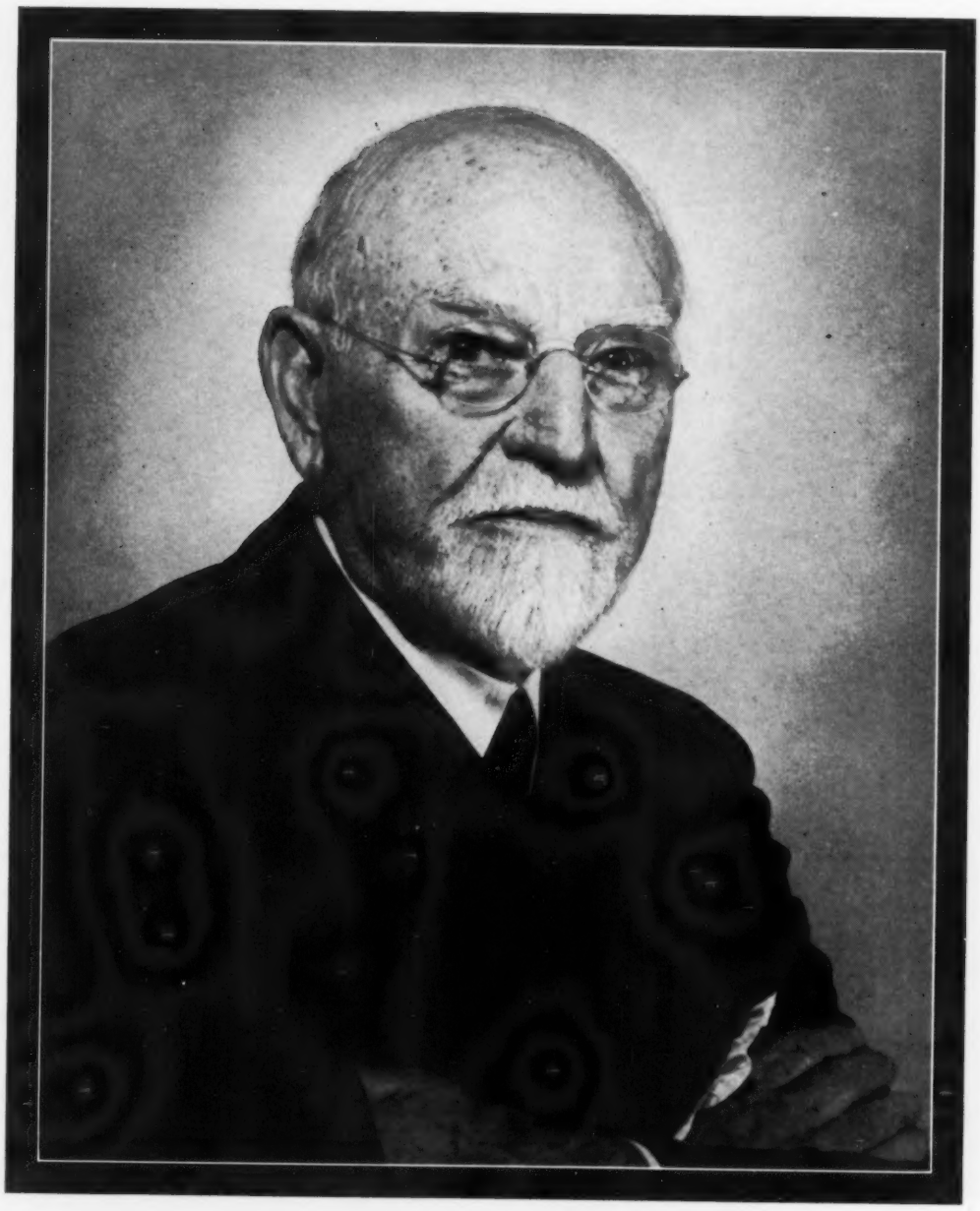
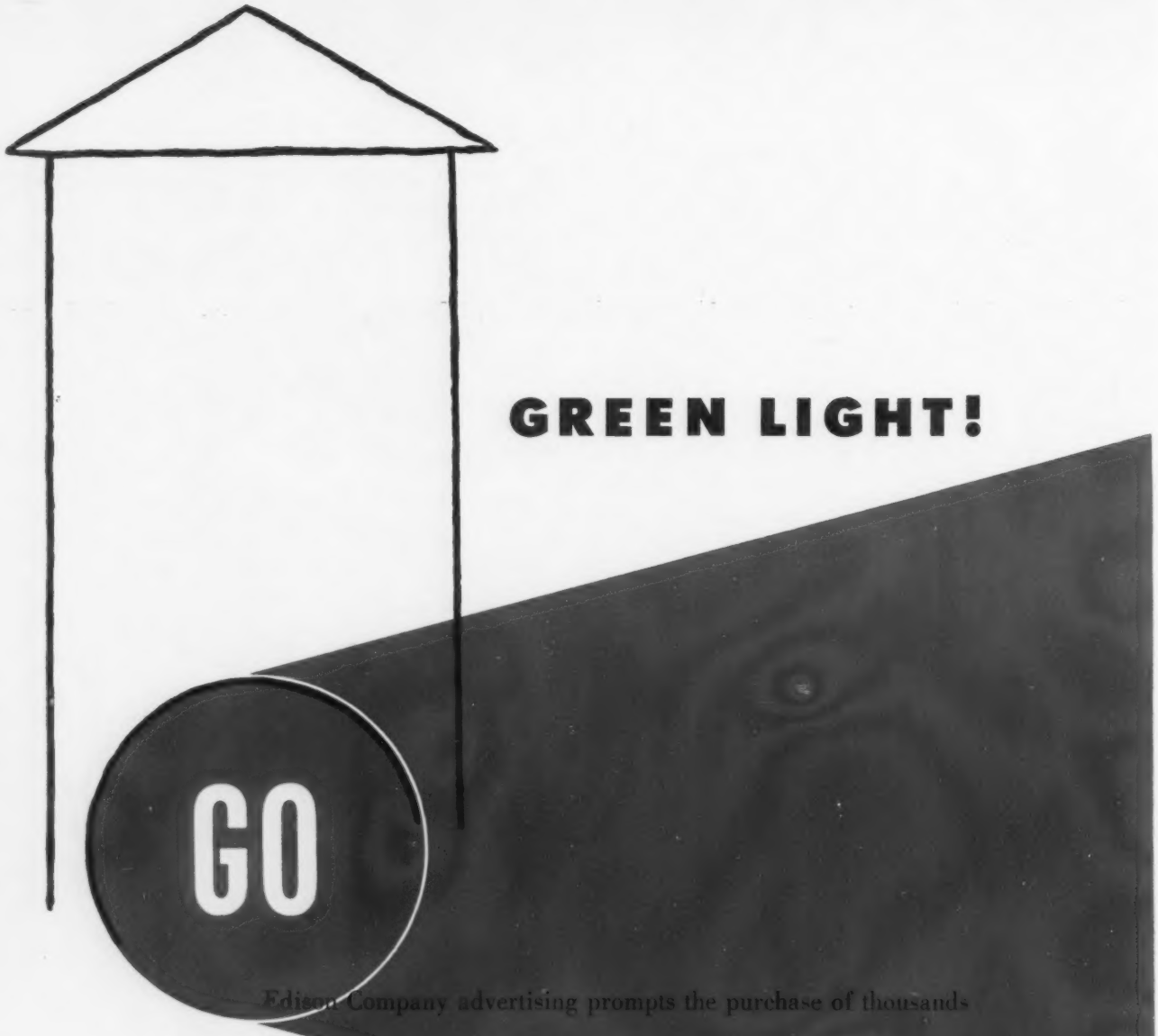
ELECTRICAL WEST

March 1948
25 cents



James H. McGraw
1860 - 1948



Edison Company advertising prompts the purchase of thousands of electrical appliances. It sells the comfort, pleasure and housekeeping ease made possible by electrical living. And it is constantly tuned to dealer stocks, as an accurate guide to availability.

The Edison Company sells no appliances—so Edison advertisements use no brand names. The telling job they do presells the quality appliances you handle, whatever their label. Your store and your merchandise are featured parts of Edison signals to "Go Buy!"

SOUTHERN CALIFORNIA EDISON COMPANY

EXPANDS OAKLAND CABLE PLANT

to *speed* wire and cable *delivery* in the west

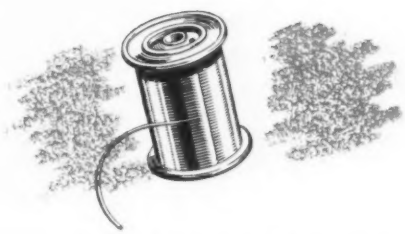
The Oakland Cable Plant of General Electric has been expanded. Formex magnet wire is now being manufactured; capacity for Flamenol cable has been increased. New machines are now operating. Inventories are being built so that many standard sizes of wire and cable can be bought from stock.

To western industry, this means faster delivery. It means even more personalized service. It means assurance of the same high quality for which all G-E wire and cable products are justly famous.

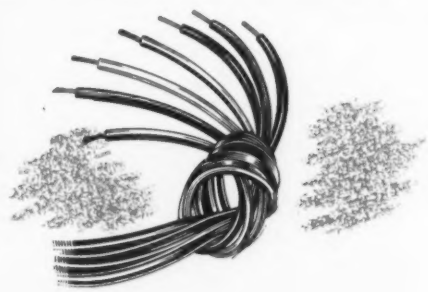
* * *

The new addition to the Oakland Cable Plant is only one part of General Electric's west-coast expansion program—a program which means that the total west-coast employment of General Electric will soon approach 12,000 persons—in eight different plants.

If you need good cable and fast western service, just get in touch with your nearest G-E office. Apparatus Dept., General Electric Company, Schenectady, N. Y.



FORMEX Magnet Wire—The Oakland Cable Plant is now manufacturing Formex Magnet Wire. Its extremely flexible, abrasion-resisting insulation makes it easy to wind and easy to handle. Formex saves space, simplifies varnish treatment, has more feet per pound than ordinary magnet wires.



FLAMENOL — Manufacturing capacity of Flamenol cable at Oakland has been increased approximately 50 per cent. This long-lived insulation simplifies wiring jobs, saves space. It offers superior physical properties and high dielectric strength to countless low-voltage applications.

GENERAL ELECTRIC

503-29

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

PRINT IN BINDING

MARCH 1948

SPOKESMAN FOR MOST HIGHLY ELECTRIFIED REGION OF THE U. S.
The all-industry magazine of progress, established 1887, and incorporating the "Electrical Journal", "Journal of Electricity, Power and Gas" and "Journal of Electricity'. Contents Copyright. Sixty-first year of publication.

ELECTRICAL WEST

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EXTRA— NEXT MONTH

Believing that a business magazine has a responsibility to render genuinely needed service to its readers, for many years this publication has compiled, edited and published a very valuable help to Westerners—a directory of manufacturers and their Western agents or representatives. This directory speeds service from such manufacturers by telling those in the electrical industry who would buy from them or contact them whom to see, nearest at hand. During the war this directory was one of the information tools that proved its usefulness a thousand times. It is just as useful now.

To render a similar service to appliance dealers and utilities Electrical West has published directories of factory authorized appliance parts and repair service sources. When appliance manufacture stopped, this directory was highly useful in helping the industry to keep the public's appliances in repair until they could buy new. But such a directory is needed by the industry right along. Last April it was printed alongside the manufacturers' directory. Next month Electrical West will bring out the new 1948 edition of both these directories. It will be published as part 2 of the April issue, separately bound for reference all year 'round.

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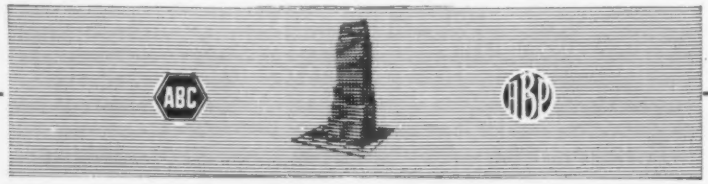

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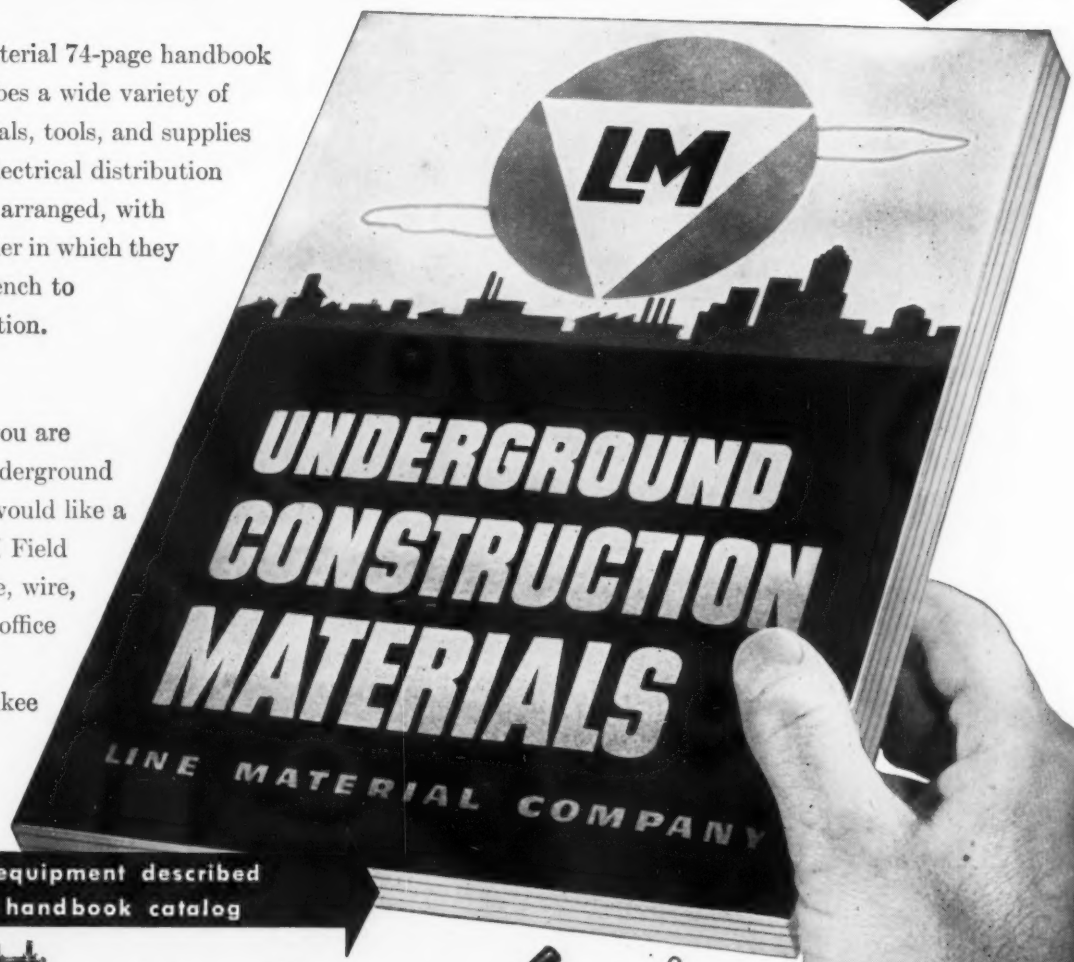

Some of the equipment described in this new handbook catalog

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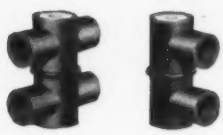

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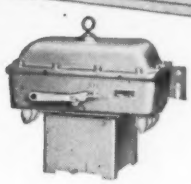

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able splicer's trailer, jacks, pumps, owers, lamps, torches, furnaces, ols, and other equipment and sup- es . . . Pages 16-68

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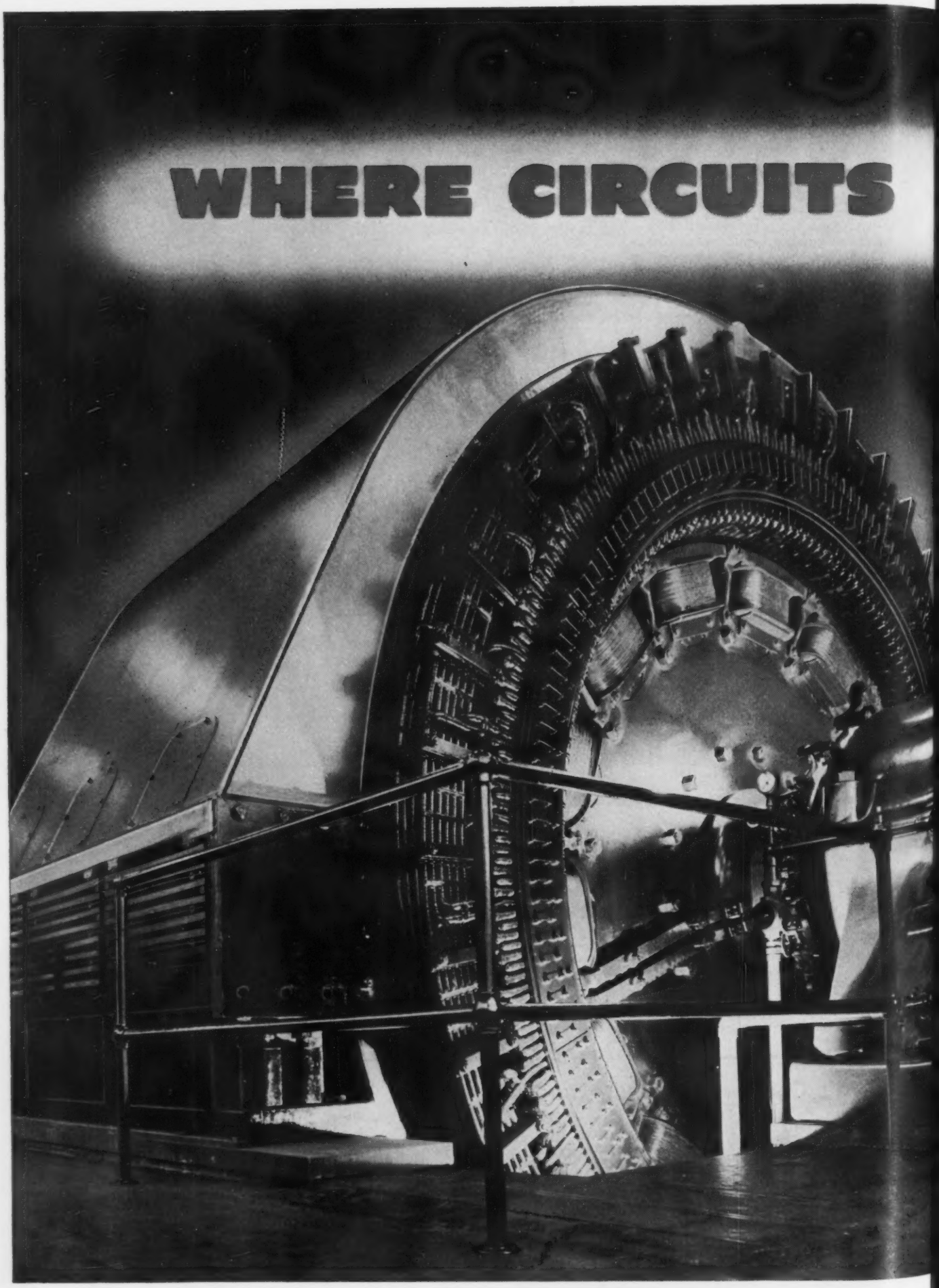
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RUN A FEVER . . .

FOR HIGH OPERATING TEMPERATURES in power, heat and lighting circuits, Roebling Varnished Cambric Cable gives you heat-resistant insulation far and away superior to rubber. There's no better specification for generator and motor leads . . . it's proved an outstanding performer on leads for transformer and oil switches.

Roebling Varnished Cambric Cable is made in single and multiple conductor types . . . single, in sizes from 2,000,000 C.M. to No. 14 A. W. G. Both constructions are recommended for use up to 17,000 volts between phases . . . 26,000 volts for single conductor grounded neutral. The cable is given a lead sheath for service where moisture is encountered and for underground installation. Other types of outer coverings are often supplied to adapt the cable for special conditions.

Like all Roebling electrical wire and cable, Varnished Cambric Insulated Cable is a combination of the finest materials and of Roebling engineering, experience and production skill . . . your assurance of superior, lasting service. Write for Catalog J-900 and for any detailed information you may require, or communicate with your nearby Roebling distributor—he'll be glad to help you.

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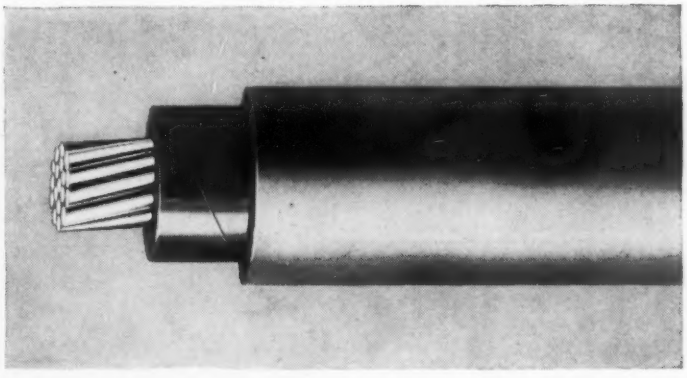

★ *WIRE ROPE AND STRAND* ★ *FITTINGS* ★ *SLINGS* ★ *SUSPENSION BRIDGES AND CABLES* ★ *AIRCORD, AIRCORD TERMINALS AND AIR CONTROLS* ★ *AERIAL WIRE ROPE SYSTEMS* ★ *ELECTRICAL WIRE AND CABLE* ★ *SKI LIFTS* ★ *HARD, ANNEALED OR TEMPERED HIGH AND LOW CARBON FINE AND SPECIALTY WIRE, FLAT WIRE, COLD ROLLED STRIP AND COLD ROLLED SPRING STEEL* ★ *SCREEN, HARDWARE AND INDUSTRIAL WIRE CLOTH* ★ *LAWN MOWERS*

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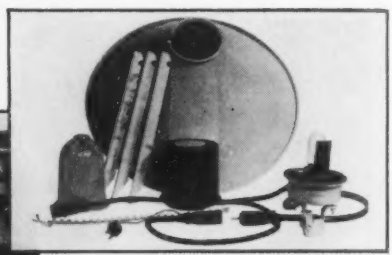
For one, two and three runways and for airports adjacent to small cities, G-E provides a packaged runway lighting system which is very easy to install.

The control items in this packaged system are shown to the left. The young lady is sitting on the constant current regulator, installed in the control tower of the airport, and plugged into the main distribution system. Switches on top of the cabinet control runway selection, brightness of the lights and any other lights which may be required.

The transformer is buried in the ground along the runway, adjacent to each lighting fixture.

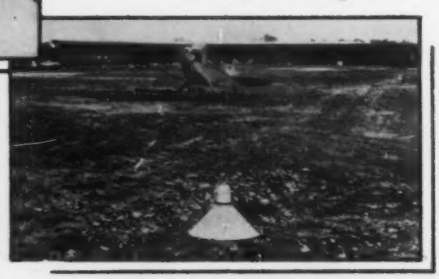


HERE IS THE EQUIPMENT which is installed beside the runway or landing strip.

EASY TO INSTALL. Above, the cable trench is being prepared with plow and truck.

DISASSEMBLED RUNWAY MARKING LIGHT. Checking level of the ground.

ORIENTING THE MARKER LIGHT and lens by sighting.



COMPLETED INSTALLATION. Lights are located 200 feet apart on both sides of runway or landing strip.

COLUMN-MOUNTED RUNWAY MARKER LIGHT. Optional.

Either type may be specified—for stake mounting or column mounting.

SEE YOUR NEAREST OFFICE FOR DETAILED INFORMATION

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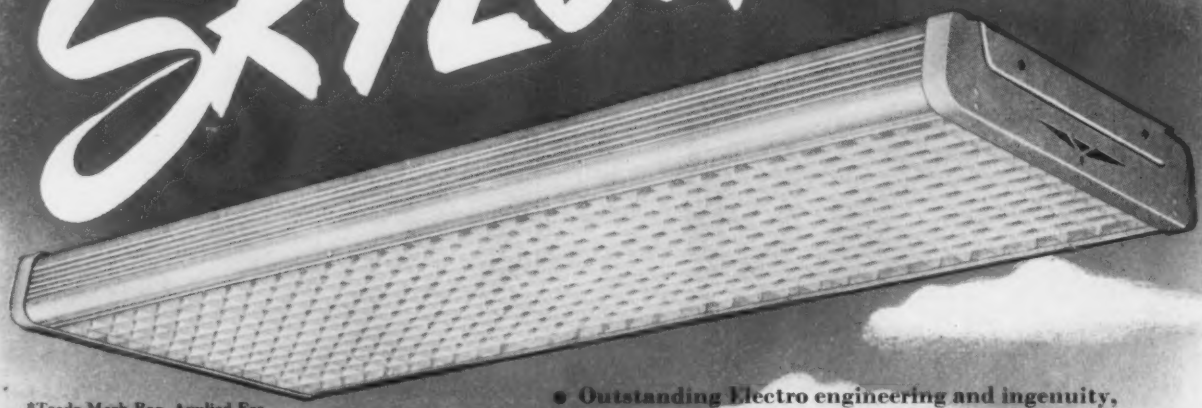
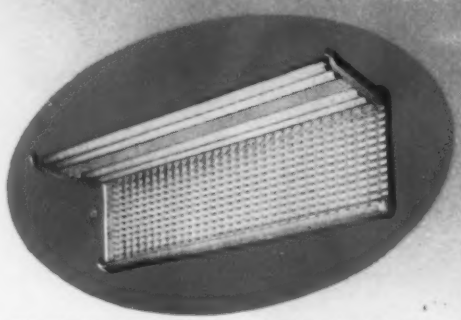
*SKYLOUVER



*Trade Mark Reg. Applied For



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No. 1025—2-lt 40 watt

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- **Available in 4-lamp 40 watt and 2-lamp 40 watt, Surface or Pendant mounted**
- **All models are used for *Individual* or *Continuous* row installation without the addition of extra parts**

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(Electrical Metallic Tubing)

EASY TO INSTALL

in close quarters and in corner locations

PERMANENT GROUND

VIBRATION PROOF

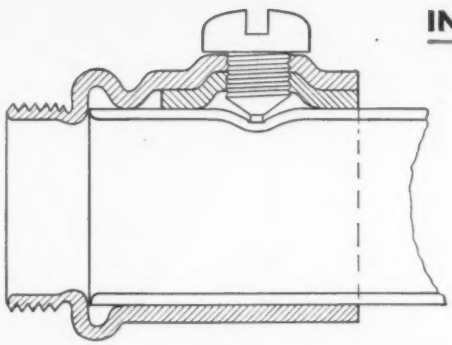
CLOSE, ACCURATE FIT

EASY TO INSPECT

RE-USABLE

ECONOMICAL

NO WRENCH STRAINS ON BOXES



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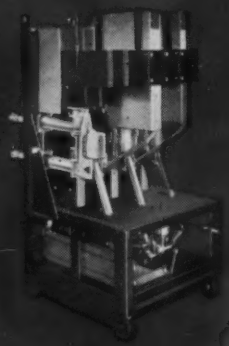
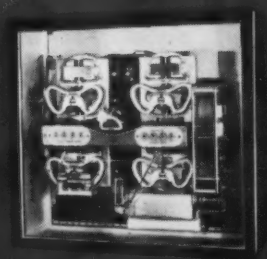
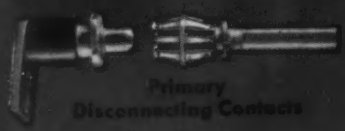


Removable Breaker Unit



Meters



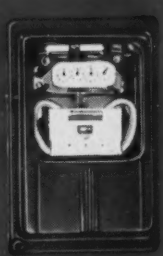
Primary Disconnecting Contacts

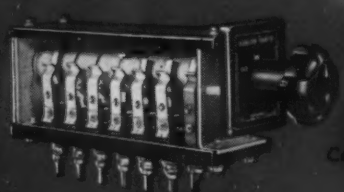
Metal-Clad Switchgear

Lightning Arrester

Instruments

Relays





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...Undivided Responsibility for Complete Reliability...

Modern Unit Substations must be inherently reliable, compact, flexible, easy to maintain and pleasing in appearance. Such a unit can best be built by one manufacturer designing, building and co-ordinating *all* component parts.

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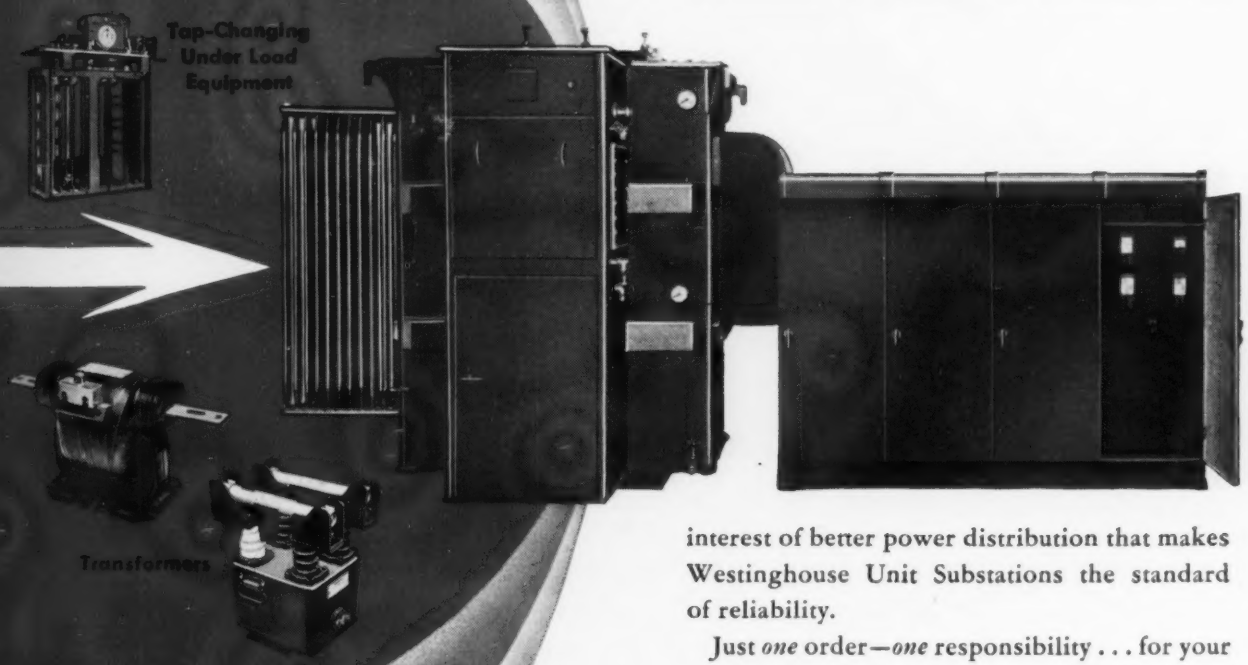

Just *one* order—*one* responsibility . . . for your power distribution equipment. Westinghouse engineers are ready to help you on any problem. Call your nearest Westinghouse office or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-97130

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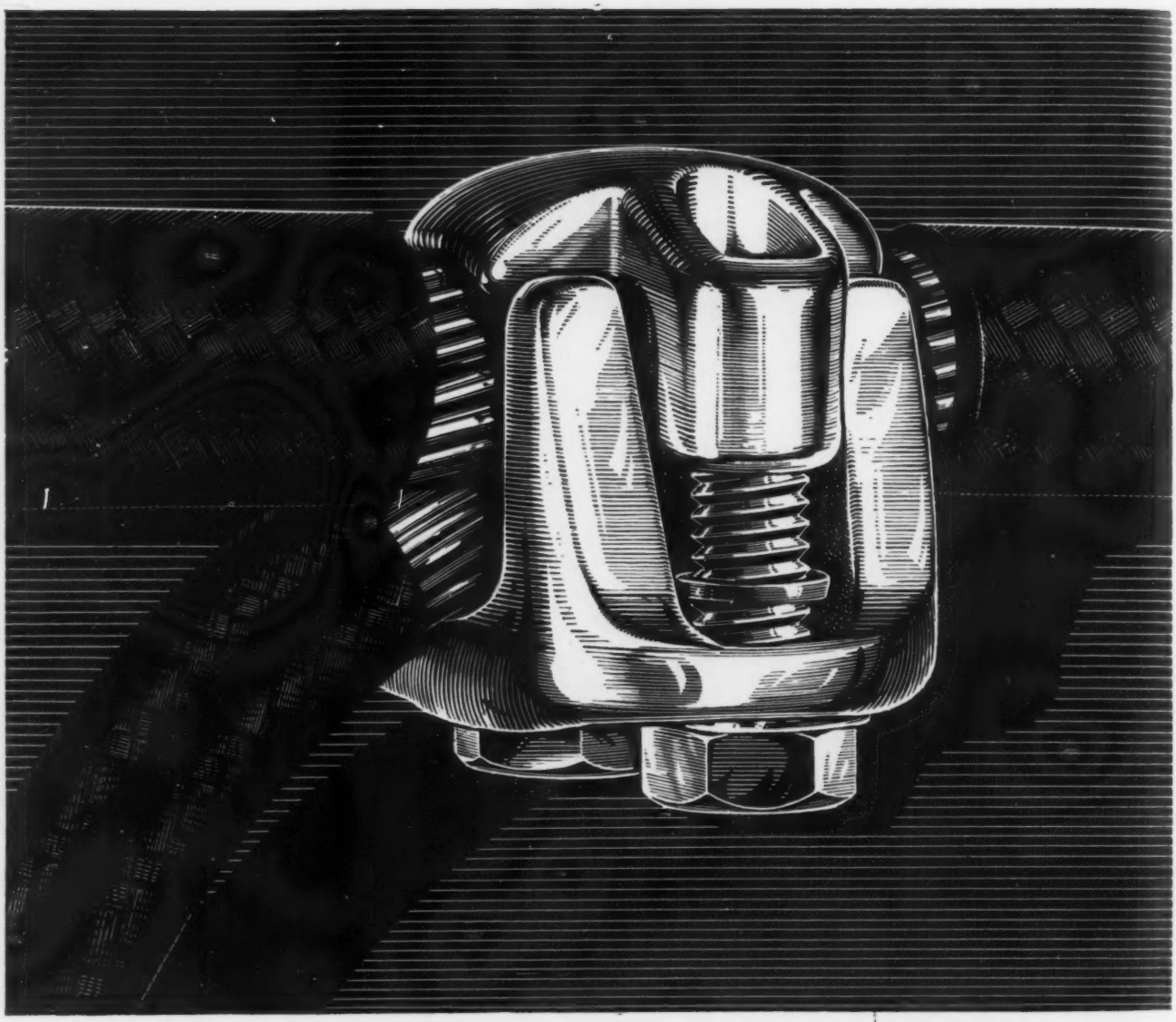

Burndy Oklip (type KVS)... the compact but *husky* connector for heavy duty service. Completely encircles and firmly forces conductors into high pressure contact. Recessed bolts and rounded edges permit easy taping. Quickly installed with ordinary wrench. Bolt retainers eliminate the hazard of loose hardware. Five sizes take all conductors from 4/0 to 1000 Mcm. Burndy connectors also available for all connecting needs. Write for a catalog, or consult your local Burndy representative . . . Whatever you connect, be sure to . . .

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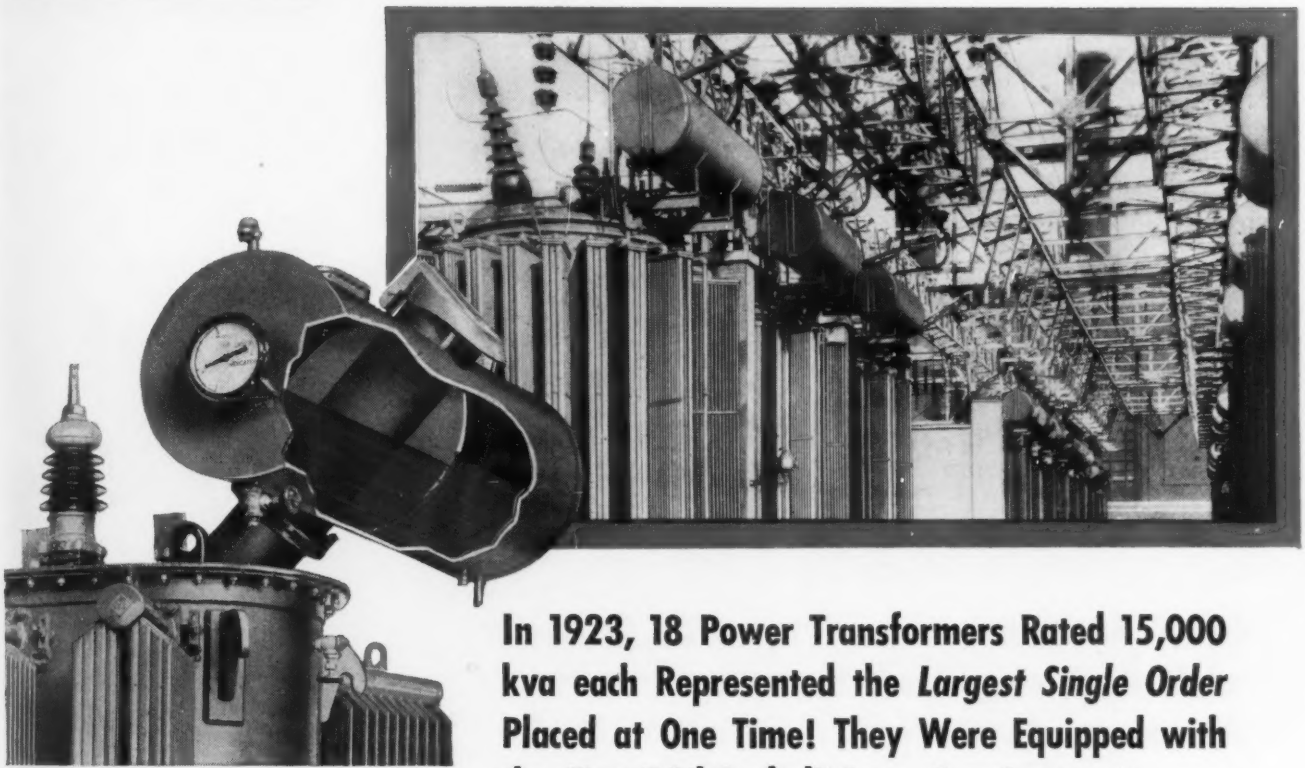
Two Big "Firsts"



In 1923, 18 Power Transformers Rated 15,000 kva each Represented the *Largest Single Order* Placed at One Time! They Were Equipped with the *First* "Oil-Sealed" Inert Gas Systems!

AFTER 24 YEARS OF SERVICE these *original* "Oil-Sealed" inert gas systems are still in operation! From the original 270,000 kva installation the Oil-Sealed system has grown in acceptance until it is standard for over 5,000,000 kva of U. S. power!

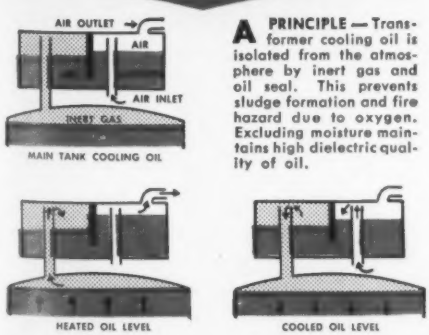
What's behind this leadership; how does it benefit you? Allis-Chalmers *pioneering* and continued efforts behind inert-gas protection have gone a long way toward the *standardization* of protection which the industry accepts today. In addition, the "Oil-Sealed" system has gained steadily increasing acceptance . . . because of its unfailing simplicity.

This remarkable system has no moving parts; no sensitive gauges or reduction valves. It does not require periodic replenishment of nitrogen; no bottles to buy. It is the lowest-pressure system available — generally not exceeding 1 lb per sq in.; and that means low pressure on gaskets, lower maintenance. System can be mounted top-of-tank or on side. ALLIS-CHALMERS, MILWAUKEE 1, WIS.

A 2354

"Oil-Sealed" is an Allis-Chalmers Trademark

SIMPLE AS A·B·C



A PRINCIPLE — Transformer cooling oil is isolated from the atmosphere by inert gas and oil seal. This prevents sludge formation and fire hazard due to oxygen. Excluding moisture maintains high dielectric quality of oil.

B AS TRANSFORMER HEATS, the cooling oil expands, displacing inert gas from main tank to auxiliary tank. The transfer of gas is cushioned by the change of oil levels as shown, keeping the main tank pressure low.

C AS TRANSFORMER COOLS, the reverse takes place. In this simple manner inert-gas protection is provided automatically . . . transformer oil adjusts itself to changing temperatures without being exposed to the atmosphere.

ALLIS-CHALMERS

Originators of the "Oil-Sealed" Inert Gas System!

Cole Electric Co.

8439 Steller Drive Culver City, Calif.

TExas 0-3243

OUTDOOR HOOK STICK DISCONNECTING SWITCH
69,000 Volts 1200 Ampere Type Y2
Single Pole, Single Throw
Special Insulators

For your biggest Fan Year ...in nearly a decade!

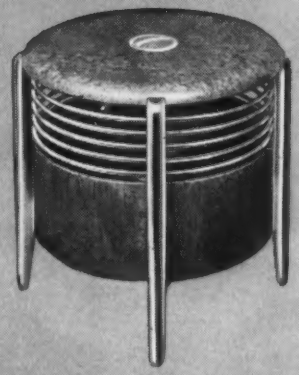
HERE, in the new R & M Fan line, you have everything to make 1948 a standout selling season. They're the finest fans we've ever made—and that after 50 years. They're profitable for you because they *stay* sold. And this is "name" merchandise that builds your reputation as a dealer in quality appliances.

Consistent national advertising, before and during the season, swells consumer acceptance for R & M Fans. Newspaper mats, folders, window streamers (all at no cost to you) and an attractive co-operative advertising allowance help you turn prospects into buyers.

So, get set for your biggest fan year in nearly a decade. See your nearest R & M Fan distributor OR mail the coupon for his name and literature on this great new R & M Fan line.

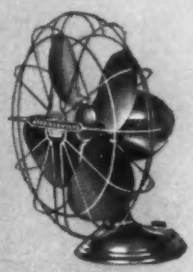
ROBBINS & MYERS, INC.

SPRINGFIELD 99, OHIO • BRANTFORD, ONTARIO

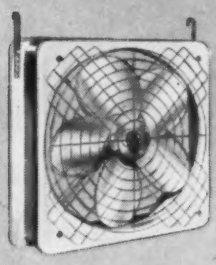


"BREEZE-ALL" FLOOR FAN—Durable mahogany plastic with chromium-plated legs and grille. Two-speed motor moves large volume of air up and outward from center of four-bladed, 12" fan. All moving parts guarded against dirt and dust. Grille gives complete protection against personal injury.

PEDESTAL FAN—Gunmetal finish on blades, motor housing and base. Bright guard. Adjustable for height—12 and 16-inch model from 38 up to 62 inches; 10-inch fan from 35 to 59 inches from floor to center of guard. Wide, quiet-running fan blades. Fully enclosed oscillating mechanism. Guaranteed five full years.



BANNER FAN—Popular-priced. Big air delivery at low current cost. Handsome bronze finish. Sturdy, die-cast motor body and base. Fully enclosed oscillating mechanism. Quiet-running 10, 12, and 16-inch blades. Two speeds on 12 and 16-inch fans. Wall-mounting bracket included. One full year guarantee.



HOME COOLER—It's *portable*—sets into open window. Ultra-quiet — no belts, no pulleys — motor mounted on live rubber. Beautiful cream enamel finish. Extends only 6½ inches into room. In 24 and 30-inch blades. Adjustable stand for 24-inch size. Three speeds on all models. One full year guarantee.

ROBBINS & MYERS, INC.,
Fan Sales Div., Dept. E, Springfield 99, Ohio

Please tell me who my nearest R & M Fan distributor is and send me new sales-promotion literature on the R & M Fans checked (√).

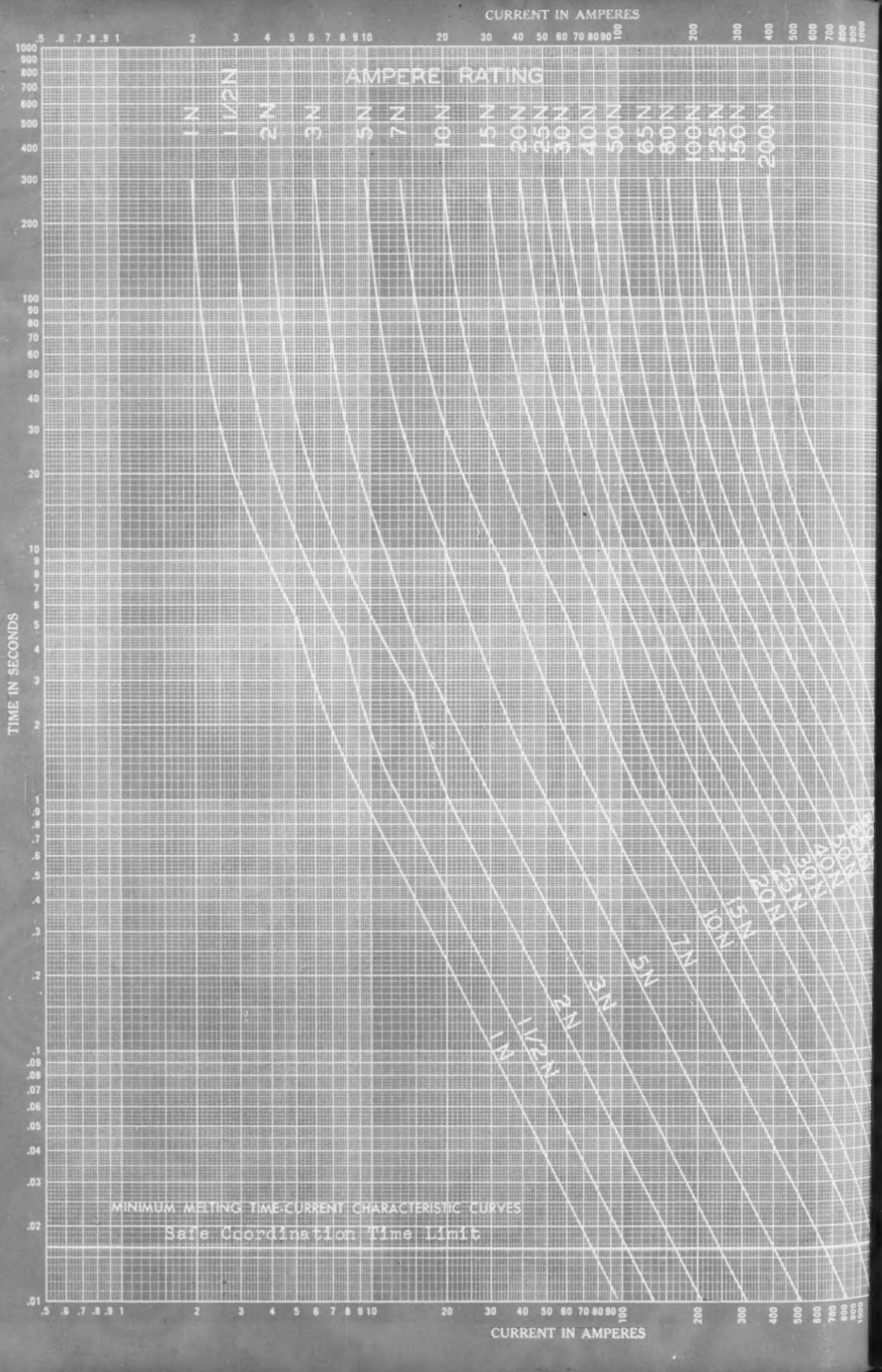
☐ Floor Fans ☐ Attic Fans ☐ Pedestal Fans
☐ Home Coolers ☐ Banner Fans ☐ De Luxe Fans

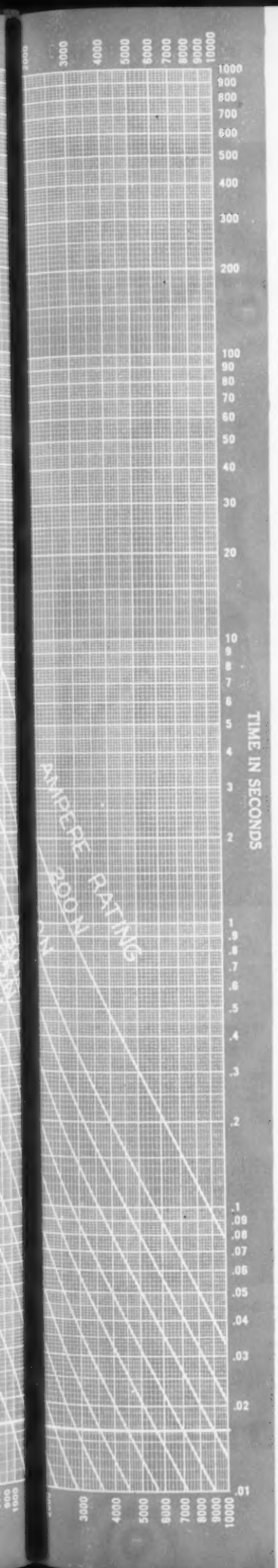
Name .....

Firm Name .....

Address .....

City ..... *Zone* ..... *State* .....


CURRENT IN AMPERES
AMPERE RATING
1N
1-1/2N
2N
3N
5N
7N
10N
15N
20N
25N
30N
40N
50N
60N
TIME IN SECONDS
MINIMUM MELTING TIME-CURRENT CHARACTERISTIC CURVES
Safe Coordination Time Limit
CURRENT IN AMPERES

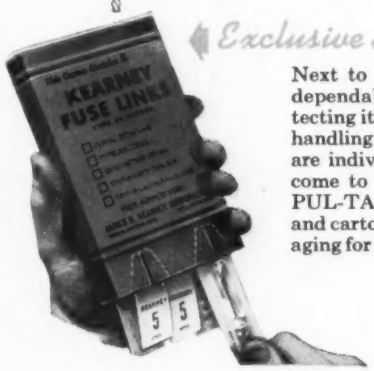


Compare
the Increased
SURGE CAPACITY of KEARNEY
K-S
FUSE LINKS

NOW you can have both high surge capacity and low temperature operation on dragging overloads when you use the K-S Fuse Links: high surge capacity so that switching or other minor lightning surges will not cause an outage; low temperature operation so that peak loads and dragging overloads can be accommodated with full protection to the line equipment and without damage to the cutout. Until recently, either one of these desirable characteristics could be had, but only by using two different fuse links.

Modern day power systems must be operated so that a service interruption occurs as a last resort and only when the alternative is extensive or permanent damage to line equipment. This means that modern fuse links must be capable of differentiating between harmless surges and overloads, and those that are damaging. One other requirement—fuse links must not only be coordinated amongst themselves so that in emergencies, selective outages will result, but the larger links must coordinate with oil-circuit breakers. That's a rather large order for a simple one-piece device, especially where cost is a limiting factor.

The K-S Links do an excellent job of meeting these requirements. Take a minute to check your fuse links with curves shown for the K-S Links. Then write to Department F for other data.



Exclusive with Kearney

Next to making an accurate, dependable fuse link is protecting it for shipping and field handling. Kearney fuse links are individually wrapped and come to you in the Patented PUL-TAB FUSE-PAK of five and cartons of 25—triple packaging for maximum protection.

For Comparison

Write to Department F for a complete set of Average melting, Minimum melting and Total clearing time curves of the modern K-S Fuse Links.

FOR BETTER CONSTRUCTION AND MAINTENANCE

Always Specify KEARNEY PRODUCTS *for the Job*

JAMES R. KEARNEY CORPORATION ST. LOUIS, MO.

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West Coast Distributor: **MAYDWELL and HARTZELL,** INC.

UNION PACIFIC

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UNION PACIFIC RAILROAD COMPANY
OMAHA 2, NEBRASKA

G. F. ASHBY, PRESIDENT

To American Industry:

The Union Pacific West offers industry proximity to products of ranch, mine and forest...ample power, fuel, water...healthful living conditions in scenic, recreational regions...and native-born, high-type labor.

Our faith in the future of this vast territory is confirmed by our current 200-million-dollar investment program for new equipment, improved and expanded facilities to provide shippers and travelers with the utmost in rail transportation.

We are at your service.

Yours very truly,

G F Ashby

President,
Union Pacific Railroad

George F. Ashby

* One of a series of advertisements based on industrial opportunities in the states served by Union Pacific Railroad.

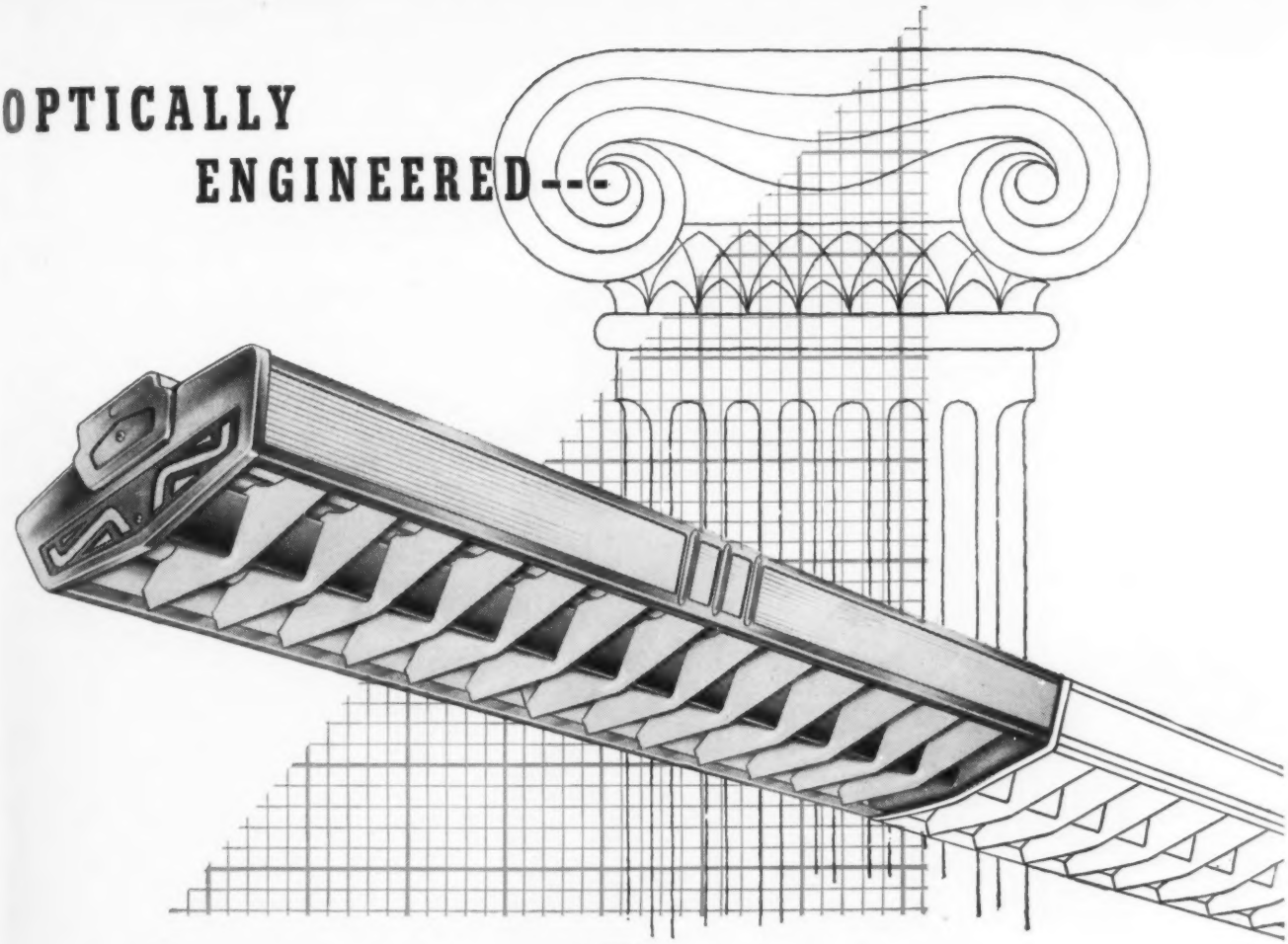
Unite with Union Pacific in selecting sites and seeking new markets in California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, Oregon, Utah, Washington, Wyoming.

*Address Industrial Department, Union Pacific Railroad
Omaha 2, Nebraska

UNION PACIFIC RAILROAD

Road of the Daily Streamliners

OPTICALLY ENGINEERED---



...For greater Beauty

Day-Brite Fluorescent Fixtures have been designed to meet the trend of modern architecture. They combine functional lighting efficiency with artistic simplicity. Our engineering service will be glad to suggest lighting layouts best suited to deliver the desired maintained intensity and harmonize with your architectural treatment.

Your near-by Day-Brite representative will be glad to assist you with your needs.

The ***VIZ-AID*** *for surface or suspension mounting . . . unit or continuous installation. Designed for two 40- or two 100-watt lamps, U. S. Patent Nos. D-138990, D-143641 and 2411952.*

Day-Brite Lighting, Inc., 5412 Bulwer Avenue, St. Louis 7, Mo.
Nationally distributed through leading electrical supply houses.
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address all inquiries to Amalgamated Electric Corp., Ltd.,
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990

IT'S EASY TO SEE WHEN IT'S

DAY-BRITE *Lighting*

America's No. 1 Connector!

Listed by Underwriters

TIME-TESTED under the most severe service conditions, BLACKBURN Hi-Strength Connectors are the top quality product in their field today. That's because they're made of DURONZE—50% stronger than hard copper or commercial bronze. They are trouble-free on the line. They produce a more efficient connection. They last longer—will not season crack. They will not twist or distort when tightened up, and can be used over and over again. In short, they are the strongest—most economical—most satisfactory connectors made!

Stop in and inspect our plant when you are in St. Louis

JASPER BLACKBURN PRODUCTS CORP.
FIRST, MADISON & CLINTON STS. • ST. LOUIS 6, MO.
Phone CEntral 3007

BUILDERS OF QUALITY PRODUCTS FOR 15 YEARS

BLACKBURN *Hi-Strength* CONNECTORS

OVER 100 CONVENIENTLY LOCATED JOBBERS

IT'S GLASS...

that gives extra performance to VITROTEX* MAGNET WIRE

ANACONDA VITROTEX magnet wire withstands temperatures up to 130° C., is highly flexible and has a remarkable space factor. All this is made possible by insulation of alkali-free glass —the ideal insulating material that is soft as silk and is comparable to steel in tensile strength.

Besides, Vitrotex offers high dielectric strength and a smooth surface that is resistant to moisture, acids, oils and corrosive vapors. For tighter, safer coils, to operate in confined spaces under high heat, make windings of Vitrotex. For details on the complete line of Anaconda Magnet Wire, write to Anaconda Wire and Cable Company, 25 Broadway. New York 4. New York.

45142

*Reg. U. S. Pat. Off.

ANACONDA

Anaconda VITROTEX THE GLASS INSULATED MAGNET WIRE

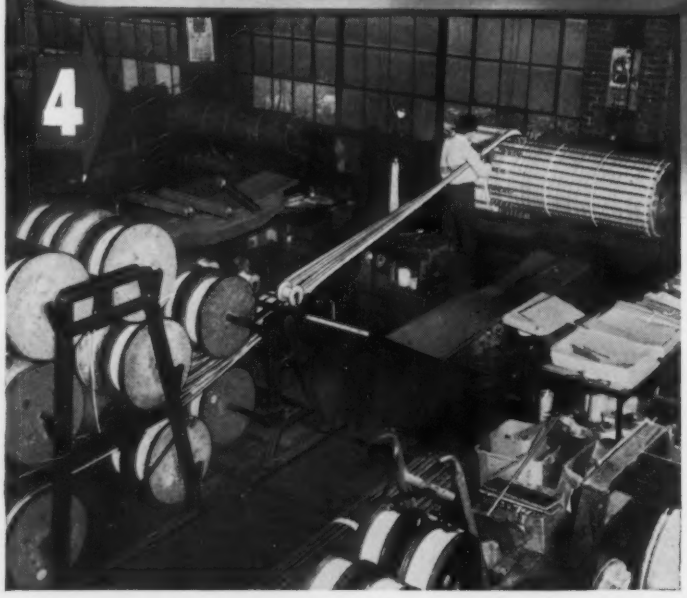
Coil Construction

ANOTHER IMPORTANT PHASE IN THE MANUFACTURE OF

Yes, fabricating the windings for Moloney Power Transformers is one of the most important phases in their manufacture. Here again tests do not completely reveal the skillful design and careful workmanship embodied in these transformers by Moloney's most experienced and responsible workers. Only the users of the millions of Kva of Moloney Power Transformers now in service, can testify to their actual quality . . . measured in terms of trouble-free operation under all conditions, over many years of service.

Practically all of the nation's largest power systems and many of the largest industrial plants use Moloney Transformers. They have learned through experience that it pays dividends to purchase transformers from a manufacturer who has specialized in the building of transformers since 1896.

Above is one of three winding departments which are busy winding coils for the thousands of Moloney Transformers which are shipped monthly. In the particular department pictured, coils are wound for large Power Transformers. Winding facilities are available for making coils for transformers of sizes up to 50,000 Kva, and in voltages up to 220,000 volts. Only male workers are employed by Moloney for the actual manufacture of transformers . . . and only the most experienced and reliable of these are permitted to wind coils for the large Power Transformers.



Shown above is a veteran Moloney workman winding a coil for relatively low voltage rating. Since the current involved is high, the cross-sectional area of the copper is large. For this type of winding, a number of conductors connected in parallel, are used. Frequently, the current is great enough to require as many as thirty-two conductors to be wound simultaneously. Spacers are used between adjacent turns to provide radial cooling ducts, permitting proper dissipation of heat. Where large numbers of conductors are required, spacers are also used between groups of conductors composing each turn, to obtain uniform cooling.

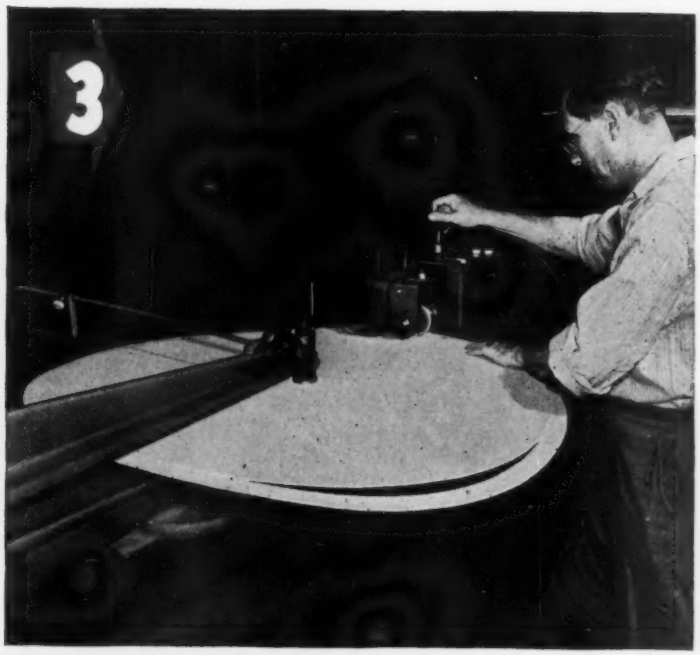
The high voltage windings of most power transformers consist of a series of individual disc coils which are interconnected just prior to assembling the transformers. Shown above is an operator winding a disc coil. These multi-layer coils usually consist of two sections separated by a pressboard collar in order to provide adequate insulation between sections. Each section consists of one turn per layer. Where taps are required, the tap lead is brazed to the winding conductor and then insulation is carefully applied.

MOLONEY

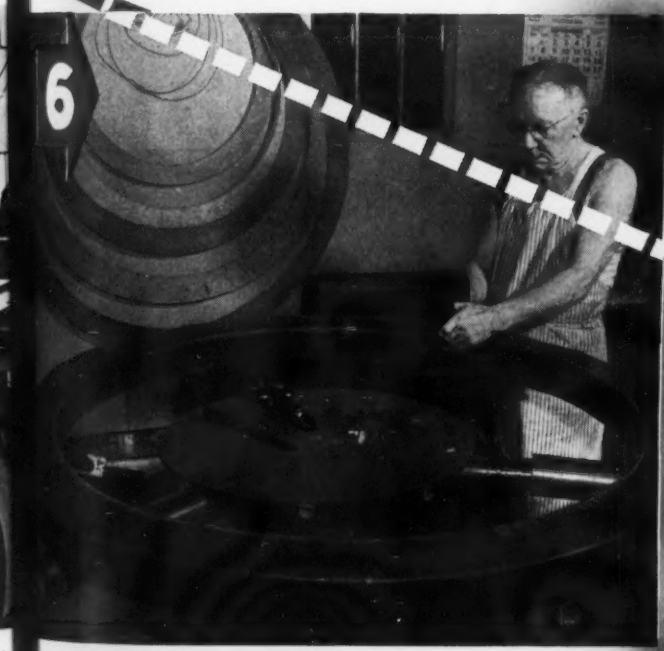
POWER AND DISTRIBUTION TRANSFORMERS EXCLUSIVELY SINCE 1896

PRINT IN BINDING

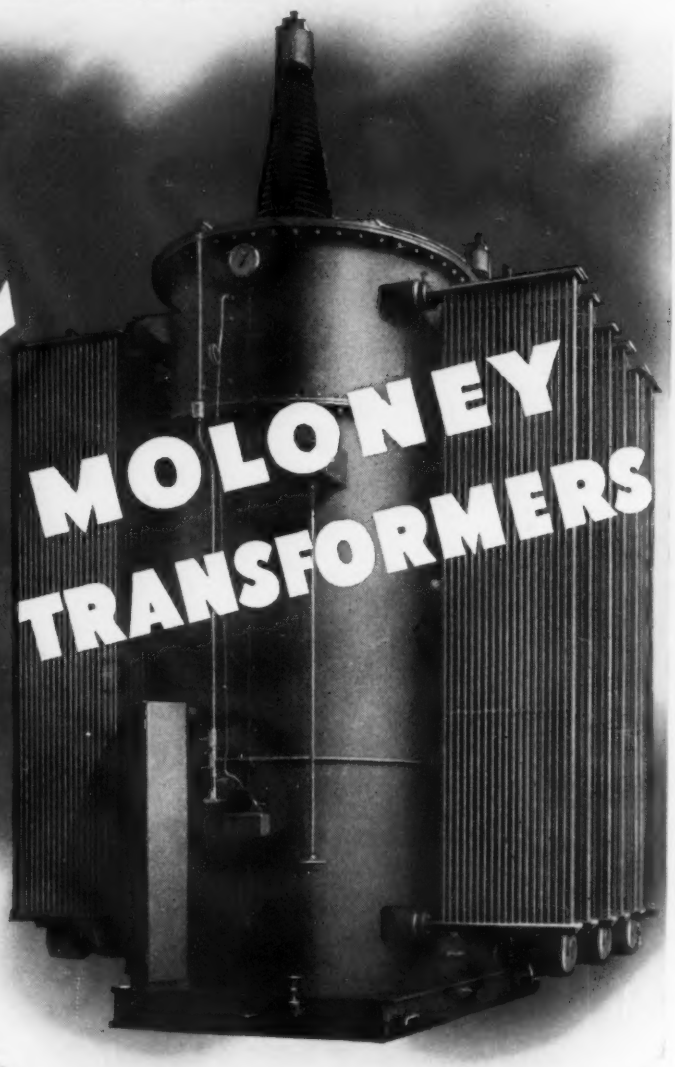
Considerable special equipment is required to produce a transformer that will withstand surges and overloads imposed in actual service. Among the special machines Moloney uses in the fabrication of transformer windings, is the conductor insulating machine pictured above. The conductors used in coils located at the line end of the winding of high-voltage transformers, are provided with extra insulation to help withstand voltage surges incident to lightning strokes and switching operations. This machine is used to provide the extra layers of cable and insulation required.



Another special machine is that for cutting pressboard insulation for various applications. In the winding department, this machine is used for cutting pressboard collars which are used for insulation between adjacent sections of multi-turn disc coils where the conductor insulation itself is not sufficient for this purpose. The pressboard used in this and other applications, is made especially for insulating purposes and is of the finest quality obtainable.



The coils at the line end of the winding take the brunt of any surge that enters the transformer and are frequently referred to as "buffer" coils. They are of special design to withstand effects of lightning and switching surges. Conductors are machine wrapped with extra layers of cable paper to provide greater than normal insulation between turns. Photo shows extra insulation being applied to the coils in the form of multiple layers of insulating tape. Proper application of the tape is important to obtain uniform insulation and adequate resistance to the effects of surges.



LECTRIC COMPANY

ACTORIES AT ST. LOUIS, MISSOURI AND TORONTO, ONTARIO, CANADA

Fashions CHANGE...

in circuit protection, too!

Time was when the lady of the house would plot a dark and perilous course to the cobwebby cellar . . . explore its electrical intricacies . . . cross her fingers—and hope for the best.

Today . . . when current fails . . . she knows just where to look! She goes straight to the *accessible* Federal NOARK multi-breaker . . . flicks a convenient switch . . . and, presto! . . . the world lights up again!

Simple, reliable, good-looking Federal NOARK multi-breakers are available in a complete range of ampere ratings — for both indoor and outdoor applications.

Write for a copy of the "FEDERALOG" address Dept. F

NEW!

TYPE MO-4 THERMAL MAGNETIC MULTI-BREAKER

Federal NOARK *Multi-breakers*

Executive Offices: 50 Paris Street, Newark 5, N. J.
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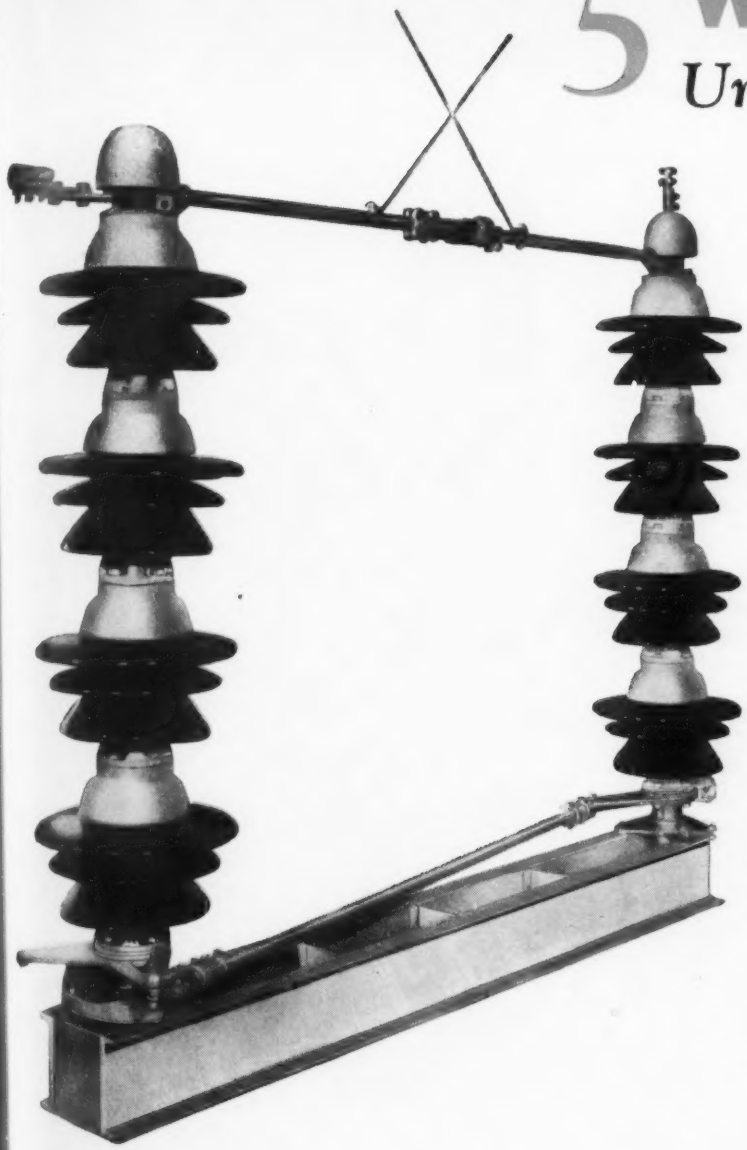
Federal Electric Products Company, Manufacturers of a Complete Line of Electrical Products, including Motor Controls • Safety Switches • Service Equipment • Circuit Breakers • Panelboards • Switchboards • Bus Duct

5 Ways BETTER
Under All Conditions



FOR SUBSTATIONS OR TRANSMISSION LINES

Isolating

By-Passing

Sectionalizing

TYPE 110, GROUP-OPERATED CENTER BREAK, DISCONNECTING SWITCH

1 HIGH PRESSURE

High pressure switch contacts assure dependable operation under **all** conditions of atmospheric contamination. **Rugged high strength, high conductivity copper-alloy** contacts are designed to operate under the most adverse conditions.

2 POSITIVE CONTACT PRESSURE

Contact pressure is provided by a stainless steel spring which is compressed to 300 pounds in assembly. In operation, contact engagement further compresses this spring, providing more than adequate contact pressure. **Wiping action,** under this high pressure, effectively removes corrosive scale.

3 EASE OF OPERATION

The type 110 is a double rotating insulator switch. Each stack of insulators is supported on a **non-corrosive, greaseless** ball-bearing, designed and manufactured for a life time of trouble-free operation.

4 ADAPTABLE

The type 110 is particularly adaptable for use in higher voltages for regulator or oil circuit breaker isolating or for sectionalizing service. It may be mounted in any position with no need for counterbalancing. Space between phases is less than that required for conventional single side-break switches.

5 POSITIVE STACK ALIGNMENT

Another exclusive Southern States PLUS value! The bronze rings, of tapered thickness, at base of insulator stacks, facilitate switch alignment during field assembly. These adjustable rings make shims unnecessary, and assure **permanent, positive** alignment!

Southern States Equipment Corp.

HOME OFFICE AND FACTORY — **HAMPTON, GEORGIA**

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Whatever your varnish requirements, there's a Pedigree Insulating Varnish which will satisfy on every count.

. . . and if you need prompt, helpful service, you'll find Pedigree Distributors are men you'll like to deal with.

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THE P. D. GEORGE COMPANY

ST. LOUIS, MISSOURI, U. S. A.

Bethlehem Pacific Towers in the Vaca-Dixon-Moraga Power Line

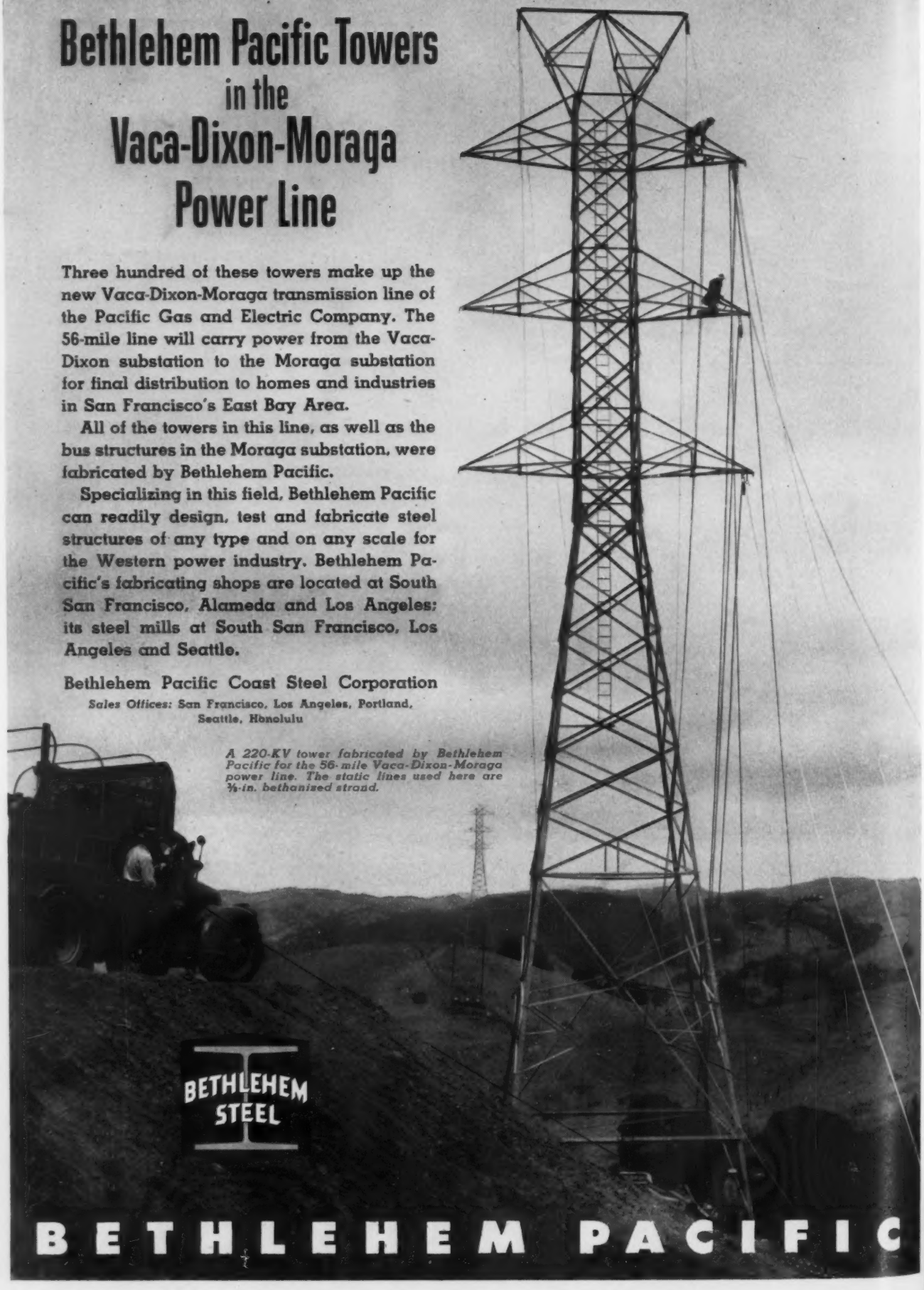
Three hundred of these towers make up the new Vaca-Dixon-Moraga transmission line of the Pacific Gas and Electric Company. The 56-mile line will carry power from the Vaca-Dixon substation to the Moraga substation for final distribution to homes and industries in San Francisco's East Bay Area.

All of the towers in this line, as well as the bus structures in the Moraga substation, were fabricated by Bethlehem Pacific.

Specializing in this field, Bethlehem Pacific can readily design, test and fabricate steel structures of any type and on any scale for the Western power industry. Bethlehem Pacific's fabricating shops are located at South San Francisco, Alameda and Los Angeles; its steel mills at South San Francisco, Los Angeles and Seattle.

Bethlehem Pacific Coast Steel Corporation

Sales Offices: San Francisco, Los Angeles, Portland, Seattle, Honolulu



A 220-KV tower fabricated by Bethlehem Pacific for the 56-mile Vaca-Dixon-Moraga power line. The static lines used here are ⅞-in. bethanized strand.

BETHLEHEM STEEL

BETHLEHEM PACIFIC

YOU CAN TELL INSTANTLY:

Wire Size: A different color for each size from No. 8 solid to No. 1000 MCM.

Characteristics: Code symbol quickly identifies whether connector is Standard, Nut Retainer, Plated, Long, Plated with Washers or with Spacer.

A NEW KYLE FIRST...the connector package that says... *"HERE IT IS!"*

Each LM Connector Package Fully Identifies Contents as to... Size... Characteristics... Wire Type.

Line Material Split-Bolt Connectors . . . in styles and sizes for every type of electrical connection . . . now come to you in a handsomely styled package so plainly marked as to take all the confusion out of stockkeeping.

Each package is plainly marked *on both ends* with a picture of the connector it contains, its characteristics and the sizes and types of wire for which it is designed. Each type and size of connector is designated by separate and distinctive color which adds to the convenience of selection.

For many years the industry has enjoyed such features of Line Material Split-Bolt Connectors as accurate machine-cut threads with no sharp edges . . . the high strength, free-running nut . . . the close-fitting pad with its rounded bearing surface . . . the ample open-end bevel for easy assembly . . . their clear markings for easy identification on the job.

NOW . . . add to this a packaging system of simple, positive, easy-to-understand markings to save time, eliminate waste and simplify stock taking . . . and these Kyle-made LM Split-Bolt Connectors offer service both in the field and in the stockroom that is outstanding.

Your Line Material Representative will be glad to give you full information on Line Material Split-Bolt Connectors to best meet your special line problems.

KYLE KC COMPANY SOUTH MILWAUKEE WISCONSIN

A DIVISION OF LM LINE MATERIAL COMPANY MILWAUKEE WISCONSIN

Build LINE SECURITY *with* CHANCE ANCHORS

CHANCE ROCK ANCHORS hold without the aid of lead or concrete

The chief difficulties of anchoring in solid rock are overcome by the use of the Chance Expanding Rock Anchor. This anchor was developed particularly to eliminate the need for lead or concrete grouting and thus reduce installation time and expense. It is installed by simply drilling a small 2″ hole to the desired depth, dropping the anchor into the hole and turning the rod with a bar through the Tripleye—the anchor expands and bites securely into the rock. No extensive drilling is required. No lead or concrete grouting is necessary and there is no time delay while grouting dries. The Chance Rock Anchor is so constructed that the harder the pull on the rod, the tighter the anchor wedges into the rock.

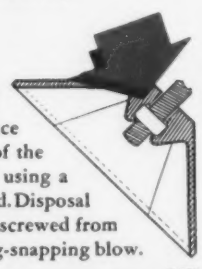
The Rock Anchor, like all Chance Anchors, is made of top quality materials selected for their durability and strength. The anchor itself is certified malleable, asphaltum dipped. The drop-forged steel rod is heavily galvanized. The forged Tripleye has three full-rounded grooves to support one, two or three guy strands and protect them from kinking or spreading.

CHANCE CONE ANCHORS *SAVE* on Installations in Rocky Soil or Hardpan

For low cost anchoring in rocky soil or hardpan, Chance Pyramid Cone Anchors effectively meet every requirement. These sturdy anchors are constructed of high quality malleable iron with flat, opposing faces which wedge solidly against tamped rock. The flaring base adds to the holding power by giving a final grip to the wedging surfaces.

The Chance Cone Anchor features a Destructible Nut Retainer which prevents the anchor from riding up the rod even when installation is made in a hole of the same diameter as the anchor. This ability to install the anchor in close-fitting holes means a substantial improvement in holding power not possible with ordinary cone anchors.

No matter what soil condition you encounter—from soggy swamps to solid rock—specify Chance Anchors and be sure of line security.



DESTRUCTIBLE NUT RETAINER

Secured by lugs in the head of the cone, the Chance nut retainer holds the anchor firmly to the end of the rod during installation so that the advantages of using a hole the same diameter of the anchor may be gained. Disposal of the rod is also simplified as it can be readily unscrewed from the anchor or driven into the ground by a sharp, lug-snapping blow.

C4727

How much will an anchor HOLD?

Chance engineers have developed a new formula for determining the type and kind of anchor to use for every guying condition. Your copy is ready and will be sent upon request.

A·B·CHANCE CO·

CENTRALIA, MISSOURI · SAN FRANCISCO, CALIFORNIA

ABC INDUSTRIES

LETTERS TO THE EDITOR

To the Editor:

One of our members has sent us a copy of the editorial entitled *Whose Code Is It?* which apparently appeared in your magazine for December 1947. In this editorial you refer to the NFPA as "the creature of the insurance companies." It is evident from this that you do not have any understanding of our association or its membership. We happen to be a non-profit engineering and educational society with some 12,000 members. Our membership is approximately 40% industrial concerns, 30% public officials, 20% fire insurance people, and 10% miscellaneous. We are not controlled by any group and naturally do not like to be referred to as subservient to any interest.

Again we are puzzled by your reference to the apathy of our association towards the code. For over 20 years we have maintained an electrical field engineer whose job it has been to promote the acceptance of the National Electrical Code throughout the country. We feel that our association and our Electrical Committee are staunch defenders of the code and that the Electrical Committee has performed a remarkable public service over many years in the development and promotion of the code. . . .

PERCY BUGBEE,
General Manager,
National Fire Protection Association, International,
Boston, Mass.

To the Editor:

In the December issue of ELECTRICAL WEST on page 106 was printed the following article:

"New Rate Reverses Sliding Scale—Soak the rich is an old socialist slogan. Time was when municipal ownership was offered on the platter of lower rates, but Palo Alto's city system recently reversed the process—it raised its rates for domestic service on a sliding scale that penalizes a person for using more electricity. Perhaps it is motivated by the socialistic concept that if a person is plutocrat enough to afford a range and water heater he ought to pay more for his electricity. A person using about 1,200 kw. per month now has to pay about 27% more than he did under the old rate. The more used, the worse it gets."

The article is misleading and seems to distort the facts. The statement that domestic rates were raised on a sliding scale leads one to believe that the higher steps in the rate structure carry a higher unit cost than some of the lower steps, i.e., a rate structure whose unit rate rises with increased consumption beyond a certain low point. Such is not the case, but your article has made it appear so.

The Palo Alto domestic rate was revised to bring it in line with the PG and E Co.'s D-2 domestic rate for San Jose, Sacramento, Fresno, etc. This involved a change in the last block of the rate structure from $0.0075 to $0.01 per kwh., which amounts to a 33⅓% raise of the last block. It is possible to say therefore that the consumer pays a certain percentage more for his electricity under the new rate when compared to the old, and it is true that the percentage increases as the consumption increases because of the presence of the lower blocks and the service

Architects and Contractors agree

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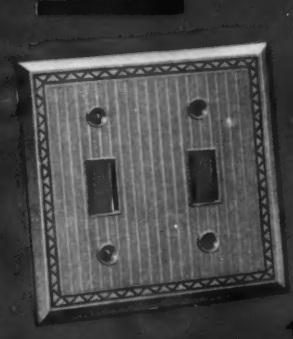

FLUSH TOGGLE SWITCHES. Quality throughout. Dust-proof, molded plastic housing. Smooth, quiet action, 5 Amps 250 Volts, 10 Amps 125 Volts. Catalog No. PT-50 Brown; PT-50-I Ivory.

WALL PLATES. Attractively designed. Single and Two Gang Toggle Plates of sturdy heavy molded thermosetting plastic. Single—Catalog No. PT-91 Brown, PT-91-I Ivory. Two Gang—Catalog No. PT-95 Brown, PT-95-I Ivory.

OUTLET BOX RECEPTACLES. Hexagon receptacle of attractive design, made of Ivory Molded Plaskon, with shade holder groove. 660 Watts, 250 Volts. Catalog No. PT-72—for 3¼" box; PT-73—for 4" box.

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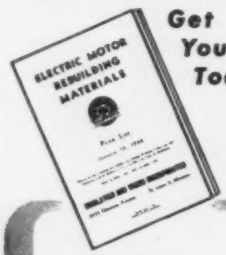

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More than 15 years experience helping repair shops do a better, more profitable job.

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charge, but it should be noted that this increase approaches 33⅓%, or the increase of the last block, asymptotically as the consumption increases. Thus, the statement, "The more used, the worse it gets" is highly misleading in that it does not present to the casual reader the true picture. In fact, the whole story appears distorted about as far as the facts would allow. One would presume that following the lead of such a reliable and conservative utility as the Pacific Gas and Electric Co. would not be grounds for the inference of socialism or "soaking the rich."

Just why the figure 1,200 kwh. was chosen for range and water heater load is not clear, for we find that such a combination uses considerably less than that amount. We must presume the figure 1,200 kwh. was picked because of the 27% associated with it. As a matter of fact, the number of our domestic consumers that use 1,200 kwh. per month is extremely small because of the competition of natural gas. The percentage increase of power bill for 99% of the consumers amounted to considerably less than 27%.

As you know, the City of Palo Alto is in the electric utility business and serves electricity within the corporate limits of the city and our relations with the neighboring PG and E are most cordial. Such attacks as that appearing in your December issue cannot serve to further these relations.

We believe that since ELECTRICAL WEST is trying to present a fair over-all picture of the electric utility business, some explanation should be made in your next issue to correct the distorted picture presented in your December issue.

C. G. SMITH
Electrical Engineer

To the Editor:

We are just a little unhappy over the Customers and Consumption tabulation appearing on page 95 of the February issue of ELECTRICAL WEST because, under the heading "Farm Customers," you show Portland General Electric Co. as having 62,000 as of Dec. 31, 1947. As a matter of fact, we do not know or have any way of arriving at the number of farm customers served. We are able to break down between customers residing within the corporate limits of incorporated cities and towns and those residing outside. Your questionnaire breaks down the number of residential customers into urban and rural. It does not ask how many farm customers we have but, when the number listed under rural appears in your tabulation, it appears as farm customers. I am sure you must appreciate that we have a tremendous number of suburban customers which might be called rural customers residing outside the cities and towns served, and that these customers greatly outnumber farm customers and have nothing to do with farming.

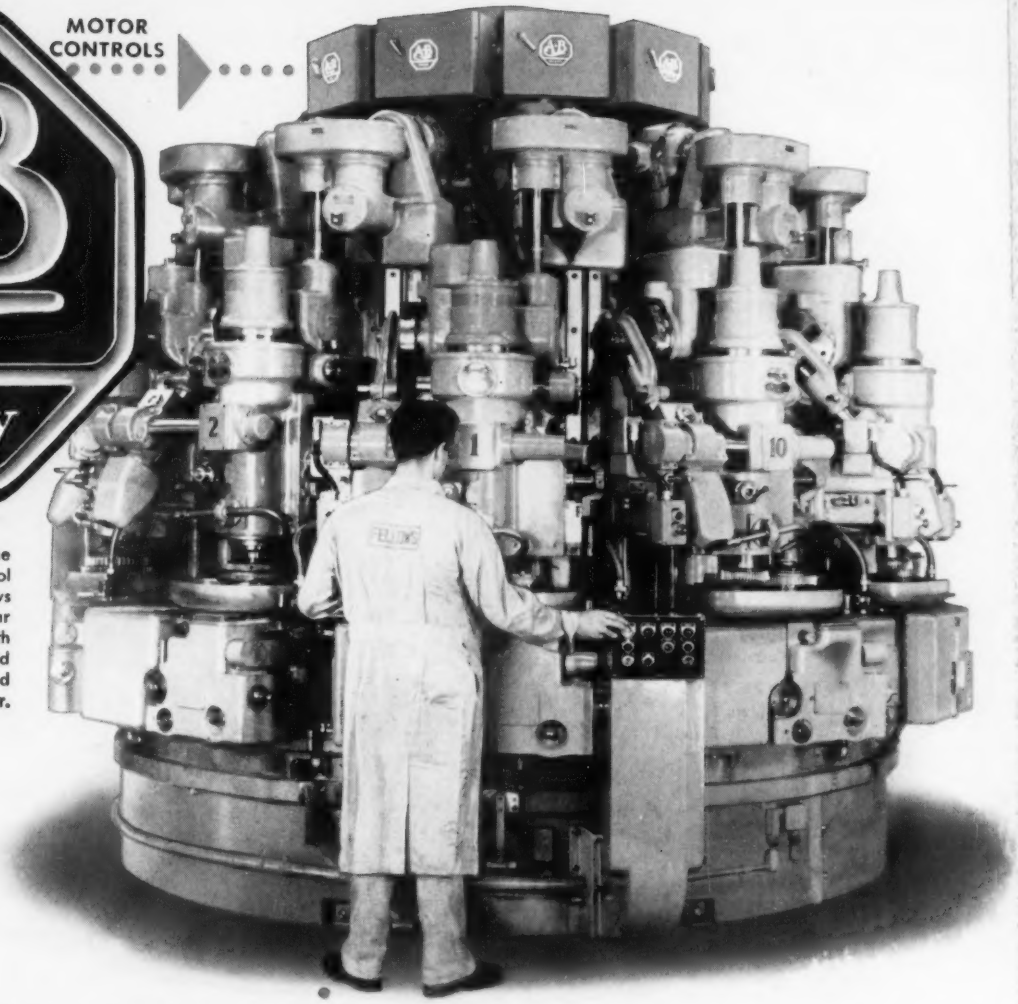
We also note that under "Commercial Customers" an error is made in showing 180,000, which should have been 18,000. . . .

I have always felt that a good many of the utilities reporting their farm customers of necessity had to make some wild guesses at a good many borderline cases . . . I would think that for all practical purposes in the future the total number of residential customers should suffice but, if a breakdown is needed, then why not break it down to urban, and suburban and farm because, after all, what you are apparently trying to get at is the proportion of residential customers in urban communities and the proportion outside of urban communities.

A. C. MCMICKEN
General Sales Manager
Portland General Electric Co.

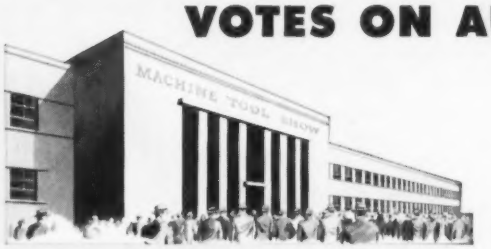
MOTOR CONTROLS

A-B Quality



A spectacular machine at the Machine Tool Show was this Fellows No. 10 Rotary Gear Shaper, equipped with Allen-Bradley solenoid motor controls mounted at the top of the shaper.

THE MACHINE TOOL INDUSTRY VOTES ON AUTOMATIC MOTOR CONTROL



At the Machine Tool Show

September, 1947

Machine tools . . . 164 freight cars and 9,651 trucks full . . . were displayed at the International Machine Tool Show in Chicago. Motor controls were everywhere. But ONE control trade-mark dominated the show . . . Allen-Bradley. On the next page, Chart A portrays some startling facts.

At the National Metal Congress

October, 1947

At another big Chicago exposition . . . one month later . . . motor-driven machines were again on display. The machinery exhibitors once more showed a preference for Allen-Bradley controls, and the A-B trade-mark was again in the lead. Chart B, on the next page, tells the story.

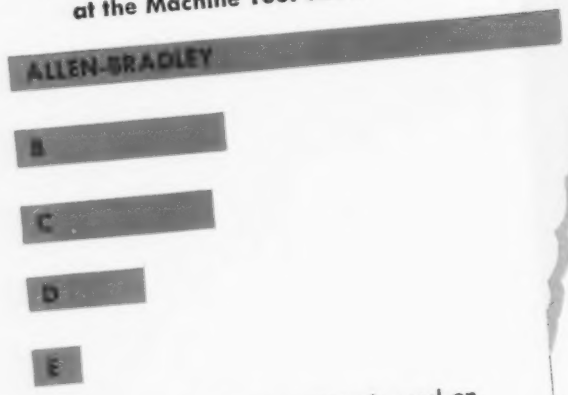
Surely such consistent control preference among machinery builders is the most eloquent proof of the dependability and trouble-free quality of Allen-Bradley controls.

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis.

ALLEN-BRADLEY
SOLENOID MOTOR CONTROL
QUALITY

See next page

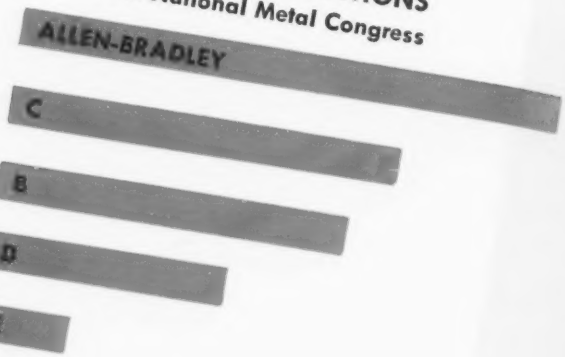
CHART A
CONTROL APPLICATIONS
at the Machine Tool Show



A census of the motor controls used on machines at the International Machine Tool Show in Chicago is portrayed above.

Nearly fifty per cent of all motor-driven machines at the big show were equipped with A-B Quality Controls.

CHART B
CONTROL APPLICATIONS
at the National Metal Congress



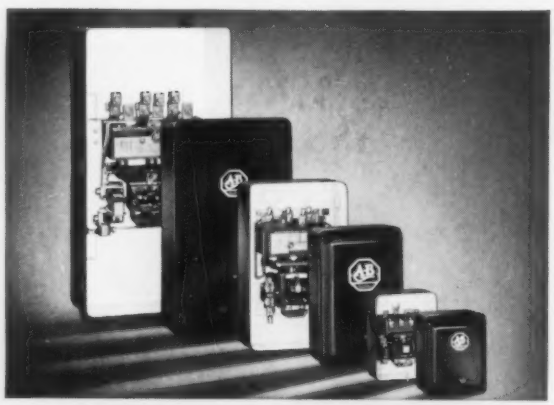
At the big National Metal Congress in Chicago, Allen-Bradley controls outnumbered every other make of motor control.

Simplicity of design . . . absence of trouble making parts . . . explain this extraordinary popularity of A-B Controls.

See front page of this insert for complete story

• • •

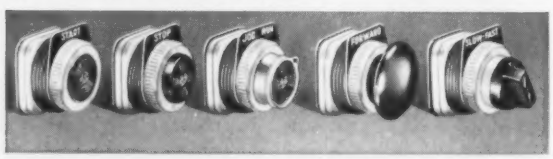
A COMPLETE LINE OF TROUBLE-FREE MOTOR CONTROLS



Allen-Bradley solenoid motor starters, in six popular sizes, will handle motors up to 100 hp, 220 v; 200 hp, 440-550 v. Simple in design . . . no pivots, pins, bearings, or hinges to corrode or stick . . . no contact maintenance . . . only one moving part. Millions of trouble-free operations.

If you want trouble-free motor controls, follow the example of the leading machine tool builders . . . use Allen-Bradley controls! Dependable action—precision performance—and attractive appearance.

The Allen-Bradley line includes several thousand types of push buttons, limit switches, float switches, temperature and pressure controls, relays, contactors... in enclosures to meet every need.



Allen-Bradley Bulletin 800T oiltight push buttons are designed especially for machine tools or other devices requiring oiltight pilot lights and control buttons.

Various forms of buttons can be supplied with several types of contact arrangements . . . all protected by oiltight diaphragms and oil seals. Send for Bulletin 800 T.

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis.

A-B Quality

ALLEN-BRADLEY

SOLENOID MOTOR CONTROL

QUALITY

LISTED UNDER REEXAMINATION SERVICE UNDERWRITERS' LABORATORIES, INC. UL

...mean 105°C continuous operating temperature

A NEW HIGH FOR EXTRUDED VINYL TUBING

Natvar 400 now has "four ridges equally spaced around the circumference, and running the length of the tubing." This marking was specified by Underwriters' Laboratories to distinguish it from tubings limited to lower temperatures.

It may now be safely used in many applications instead of varnished sleeving, with great savings in material and labor costs and reduced waste.

More and more users of extruded tubing are standardizing on Natvar 400 because, in addition to its remarkable heat and oil resistance, it is well balanced in other properties. E. T. L. and Underwriters' reports are available on request.

Natvar

Natvar Products

- Varnished cambric—straight cut and bias
- Varnished cable tape
- Varnished canvas
- Varnished duck
- Varnished silk
- Varnished special rayon
- Varnished Fiberglas cloth
- Silicone coated Fiberglas
- Varnished papers
- Varnished tubings and sleevings
- Varnished identification markers
- Lacquered tubings and sleevings
- Extruded vinyl tubing
- Extruded vinyl identification markers

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GENERAL ELECTRIC ANNOUNCES

the new FR-1 relayed AUTOMATIC RECLOSER

For improved service continuity and reduced operating costs on rural lines

Here are the FEATURES . . .

1 CHOICE OF *TWO* OPERATING FUNCTIONS . . . (convertible in the field). (a) *Two instantaneous openings plus two time-delay openings to lock-open* — permitting an exceptionally wide range of co-ordination with a large number of fuses, due to specifically designed time-current characteristics. (b) *Two instantaneous openings to lock-closed* — permitting an extended range of co-ordination with fuses; i.e., co-ordination over an even greater range of current values.

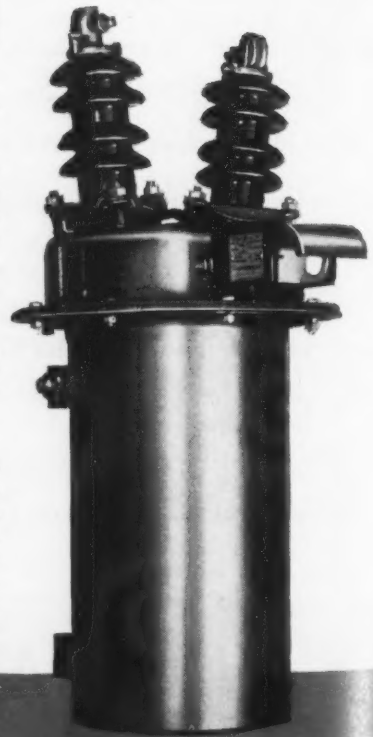
2 AN ACCURATE *MECHANICAL-ESCAPEMENT* TIMER . . . Precision timing, virtually *unaffected by changes in ambient temperature,* assures an unprecedented reliability of co-ordination of recloser-to-recloser and recloser-to-fuses, regardless of season.

3 EXCEPTIONALLY FAST RE-SETTING TO INSTANTANEOUS TRIPPING — enables clearing of rapidly recurring non-persistent faults which otherwise would cause unnecessary blowing of series fuses.

4 *RELAY CONTROL* OF MAIN INTERRUPTER CIRCUIT . . . Uses proved circuit-breaker principle; reduces forces on operating mechanism and achieves more accurate time-current characteristics; eliminates chattering of contacts and assures long life.

5 *OIL-BLAST* INTERRUPTER . . . Longer contact life, with minimum carbonization of oil, results from fast arc-extinction by same type of double-break Elkonite contacts and oil-blast interrupter used in all large G-E oil circuit breakers.

***PLUS* ELEVEN OTHER IMPORTANT ELECTRICAL AND MECHANICAL FEATURES** that bring maximum freedom from inrush-current lockouts, and that simplify installation, increase safety, prolong operating life, and minimize maintenance.



Bulletin GEA-4934 gives full data, including ordering information. Ask for it today from your nearest G-E Apparatus Office or write *Apparatus Dept., General Electric Company, Schenectady 5, N. Y*

CONTINUOUS RATINGS	5, 10, 15, 25, 35, and 50 amperes
INTERRUPTING RATINGS	25 times continuous rating
MINIMUM PICK-UP CURRENT	2 times continuous rating
FOR APPLICATION ON CIRCUITS	2400 to 15000 volts

CUTS CONSUMER OUTAGE TIME...REDUCES TROUBLEMAN TRIPS

The new FR-1 Relayed Automatic Recloser is a distinctive G-E development.

Its exclusive dual-slope time-delay curve, negligible variations of timing mechanism, and freedom from effects of ambient temperatures, make it functionally superior for modern overcurrent protection.

More Reliable Co-ordination

Now, time-current characteristics stay put—remain accurate regardless of season.

The new FR-1 recloser employs a mechanical-escapement timer that is unaffected by changes in ambient temperature. It uses a relay to control, more accurately, the opening of the main interrupter.

Together, these features give a precision of time-current characteristics never before achieved. Co-ordination remains reliable, the year 'round; false operations are eliminated; there are fewer outages, and fewer service trips.

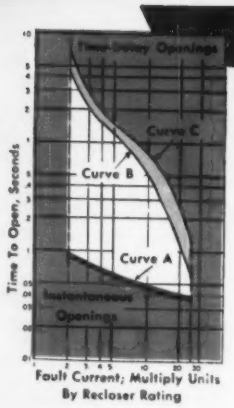
Wider Range Co-ordination

Now, co-ordination can include sectionalizing, branch-line, and transformer external or internal fuses—individually or all in series, with each recloser.

With the conventional operation—see below—it can be reliably co-ordinated with many different fuse ratings. This is because of the recloser's dual-slope time-delay curve and the year-round accuracy of its overall characteristics.

With the extended-range co-ordination operation—see below—it introduces an entirely new concept of recloser-fuse co-ordination. Here, isolation of persistent faults is accomplished entirely by co-ordination of fuses—and an even greater number of fuse ratings can be used in series with each recloser.

HERE IS THE CO-ORDINATION STORY



WITH CONVENTIONAL OPERATION—2 instantaneous plus 2 time-delay openings—a combination which has proved most efficient for minimizing the number and duration of system outages.

1 & 2—Two instantaneous openings.

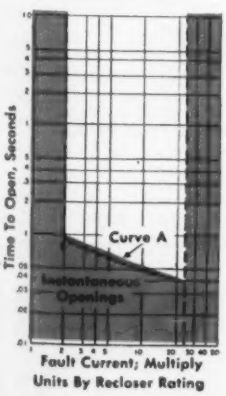
The 1st and 2nd openings are fast, with 1-second to reclose after each. Recloser will *always* trip at or below curve "A" of the chart at left, clearing all non-persistent faults with only a momentary outage, and without even partially melting fuse links coordinated with recloser.

3 & 4—Two time-delay openings.

The 3rd and 4th openings are slow, with 1-second to reclose after the 3rd opening and lock-open after the 4th. Recloser will *always* open within the upper band (between curves "B" and "C") of the chart at left, *regardless of ambient temperature.* The wide area, between Curve "A" and Curve "B" is available for reliable co-ordination of load-side fuses, permitting a choice of fuse ratings that will limit persistent faults to a minimum portion of the circuit.

5—Lock-open

Persistent faults between reclosers or between recloser and nearest load-side fuse will cause the recloser to lock open, and remain open until manually reclosed. The lock-open operation does not interfere with source-side protection because the area above Curve "C" permits reliable co-ordination with source-side fuse or circuit-breaker.



WITH EXTENDED-RANGE CO-ORDINATION OPERATION—2 instantaneous openings plus unlimited time-delay until automatic resetting—a combination extending series co-ordination with fuses, which minimizes the extent of consumer outage.

1 & 2—Two instantaneous openings.

The 1st and 2nd openings are fast, with 1-second to reclose after each. Recloser will *always* trip at or below Curve "A" of the chart at left, clearing all non-persistent faults with only a momentary outage, and without even partially melting fuse links co-ordinated with recloser.

3—Lock-closed

After the two instantaneous openings, the recloser locks closed. This introduces, in effect, an unlimited time-delay (until automatic resetting)—with persistent faults isolated entirely by co-ordinated fuses.

As shown in the chart at left, the area for co-ordination of recloser with both load-side and source-side fuses extends upward from Curve "A" *with no upper limit,* since there is no time-delay tripping characteristic. This function permits a maximum number of fuses to be co-ordinated in series with each recloser, thus increasing the number of available sectionalizing points.

4—Automatic reset

Immediately after a fuse has isolated the persistent fault, the recloser automatically resets. Service is restored and maintained everywhere except beyond the blown fuse.

GENERAL ELECTRIC

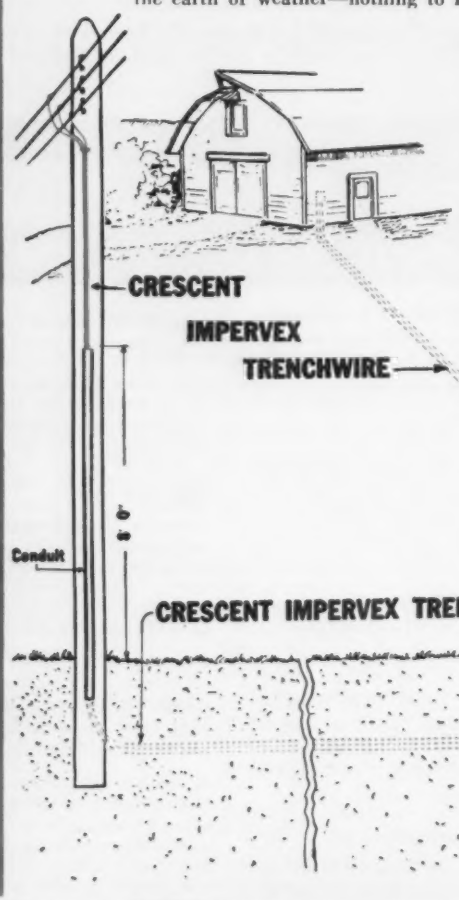
406-23

CRESCENT
IMPERVEX TRENCHWIRE

For Underground Use

• CRESCENT IMPERVEX TRENCHWIRE provides the LOWEST COST, PERMANENT underground installation for services from power line to meter, for connecting several buildings from the same service, as on FARMS, ESTATES and INSTITUTIONS and for STREET, AIRPORT, BALL PARK and other outdoor lighting and power circuits.

• CONSTRUCTION—The single copper conductor is insulated with IMPERVEX special moisture and heat-resisting rubber insulation. A tough NEOPRENE armor sheath is vulcanized over the insulation, protecting it from injury during and after installation. The cable is flame-retarding and practically UNAFFECTED by water, oil, acid, alkali, sunlight and exposure to the earth or weather—nothing to rot, rust or corrode.



• EASY INSTALLATION—Two or more IMPERVEX TRENCHWIRES are laid together in a narrow trench to form the cable with no additional protection normally required.

• APPROVED—Carries Underwriters' Laboratories' Labels as TYPE USE—Underground Service Entrance Cable, and conforms to the National Electrical Code.

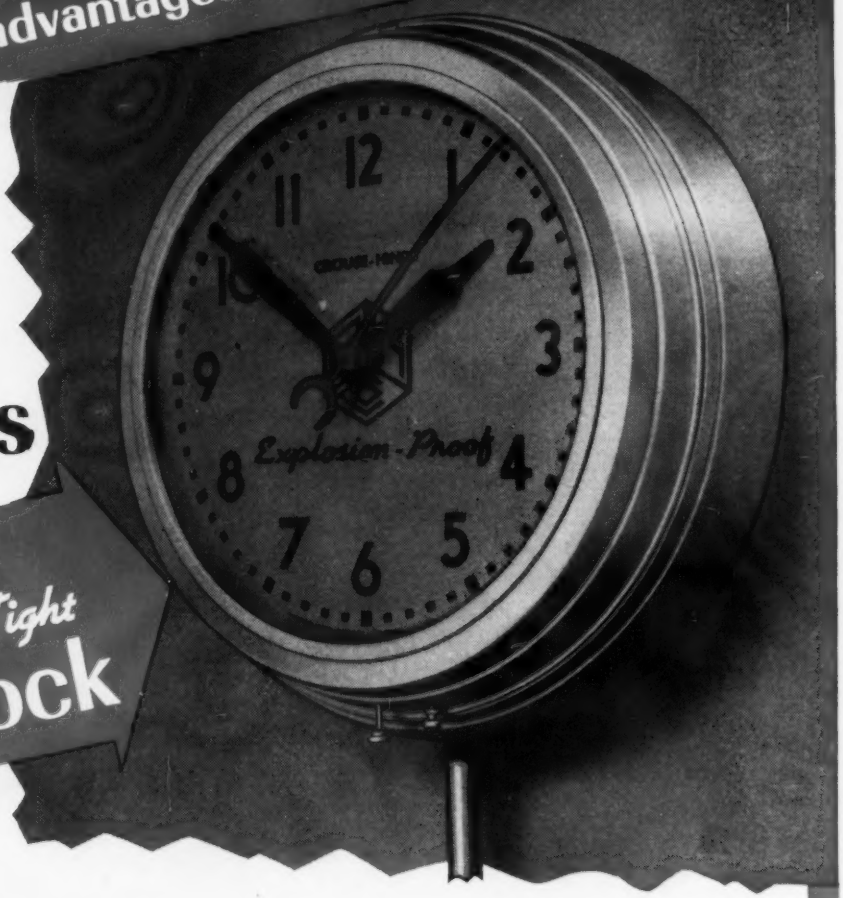
• PROVEN—Tens of millions of feet of CRESCENT IMPERVEX TRENCHWIRE have been installed over the last seven years under all types of installation conditions, with not one case of failure reported—*a unique record of dependability!*

• AVAILABLE FROM STOCK—Electrical wholesalers have CRESCENT IMPERVEX TRENCHWIRE in sizes No. 12 to No. 4 AWG in stock. Larger sizes available from warehouse stocks or the factory.

• BULLETIN No. 451 giving technical information on selection of proper size of conductor, etc., will be furnished on request.

CRESCENT
WIRE & CABLE
CRESCENT INSULATED WIRE & CABLE CO.
TRENTON, N. J.

NOW you can have the advantages of electric time in hazardous locations with CROUSE-HINDS NEW Explosion-Proof and Dust-Tight Electric Clock



Safety. Crouse-Hinds Electric Clock is safe to use in locations where explosive atmospheres are likely to be present.

Easy to read. This large electric clock has a dial 13 inches in diameter scientifically designed for easy reading. The face is satin finish aluminum with numerals, hour and minute hands in jet black, and a sweep second hand in brilliant red.

Attractive case. Finished in metallic gray enamel.

Easy to maintain. Can be taken apart in a jiffy .... without special tools. Can be reset without opening the case.

Small housing. The motor and all electrical connections are enclosed in an explosion-proof CONDULET* housing only 5-3/4 inches in diameter.

Two styles. The clock is furnished in two styles One is for flush mounting where concealed conduit is used. The minimum depth required for the CONDULET in the wall is 3-1/2 inches. The other style is for surface mounting where the conduit is on the surface of the wall. Either style can be flush mounted on a panel.

Adjustable. The CONDULET body can be mounted for either vertical or horizontal conduit connection.

Listings on new Page 12J, Section 85, CONDULET Catalog 2500.

Crouse-Hinds complete line of thousands of CONDULETS includes a cast outlet for every purpose in ordinary and hazardous locations.

**CONDULET is a coined word registered in the U. S. Patent Office. It designates a product made only by the Crouse-Hinds Company.*

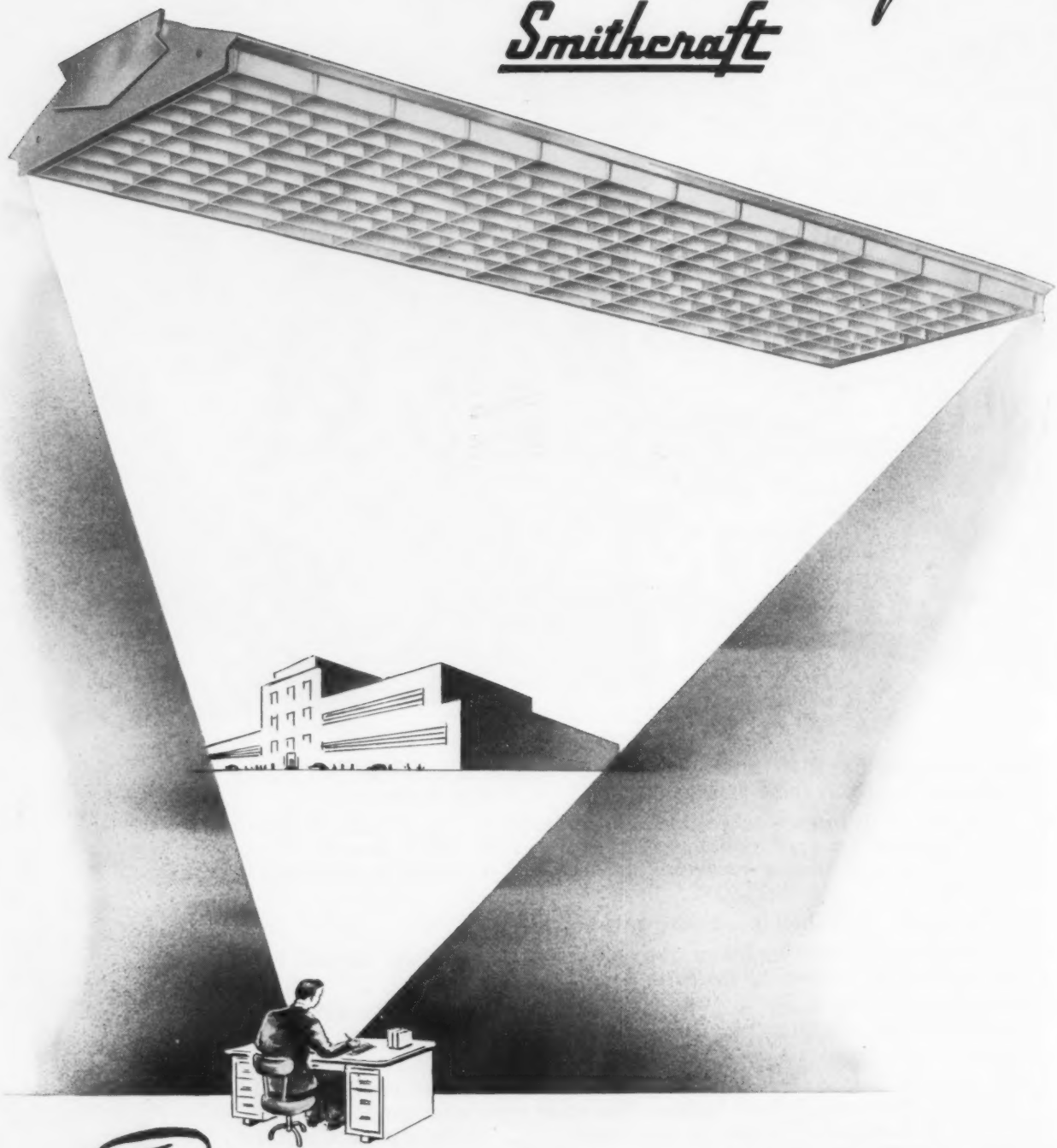
CROUSE-HINDS COMPANY
Syracuse 1, N. Y.

Offices: Birmingham – Boston – Buffalo – Chicago – Cincinnati – Cleveland – Dallas – Denver – Detroit – Houston – Indianapolis Kansas City – Los Angeles – Milwaukee – Minneapolis – New York – Philadelphia – Pittsburgh – Portland, Ore. – San Francisco Seattle – St. Louis – Washington. *Resident Representatives:* Albany – Atlanta – Charlotte – New Orleans – Richmond, Va.
CROUSE-HINDS COMPANY OF CANADA, LTD., *Main Office and Plant:* TORONTO, ONT.

A Nationwide Distribution Through Electrical Wholesalers

CONDULETS
FLOODLIGHTS
TRAFFIC SIGNALS
AIRPORT LIGHTING

DAYLITER *by* Smithcraft



for DAYLIGHT INSIDE

● A fluorescent fixture — original in design — slim and smart in appearance, with an exclusive louver pattern for high efficiency, better light output and lower brightness. Now being used with complete satisfaction in schools, offices and stores. Dayliters are easily installed and maintained.
For complete information Address Dept. 700

Smithcraft
LIGHTING DIVISION
CHELSEA 50, MASSACHUSETTS

Keep Their New Home "Free and Clear"... Of Overhanging Wires

FOR UNDERGROUND SERVICE ENTRANCES INSTALL...

RoMarine - RoPrene

UNDERWRITERS' APPROVED AS TYPE USE—STYLE RR

Customer good-will becomes more than mere words when service entrances are installed *underground*. Where there is discrimination of ownership, pride in a home beautiful, the home owner will appreciate the avoidance of unsightly overhead wires through installation of RoMarine-RoPrene.

One of the few Underwriters' *approved* types now available, RoMarine-RoPrene can be safely installed for all National Electrical Code approved 600 volt underground entrances, with operating temperatures up to 60° C. RoMarine is a long-aging insulation with excellent electrical stability in wet locations. RoPrene (Neoprene) sheath provides high resistance to soil acids and alkalies, abrasion, as well as sunlight and oxidation. Here, then, is *double* protection in a *single* cable from power circuit to meter . . . economical installation through the use of a single cable and assurance of lasting, trouble-free service.

Available as both single and multiple conductor, RoMarine-RoPrene has found wide acceptance among utilities as the ideal cable for low voltage "net-work" circuits, buried directly in the earth or in ducts, as well as, transformer leads, pole riser cables and other general purpose wiring. For full test data and construction details, write for your copy of Specification RR-1 today.

FROM BAR TO FINISHED WIRE

ROME CABLE CORPORATION

ROME • NEW YORK

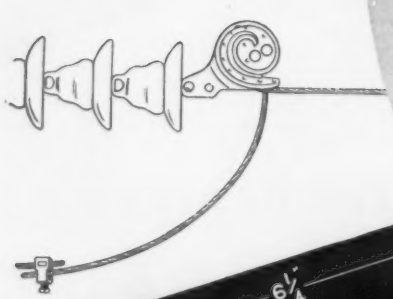
Pacific Coast Agents
PACIFIC ELECTRO SALES, INC.

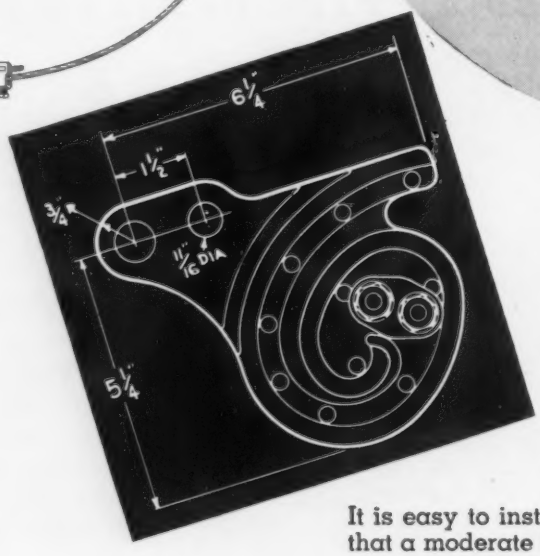
LOS ANGELES 13, CALIF.
340 Azusa Street

SAN FRANCISCO 3, CALIF.
1045 Bryant Street

SEATTLE 4, WASH.
1054 Fourth Ave., So.

SNUB DEADEND for A. C. S. R.



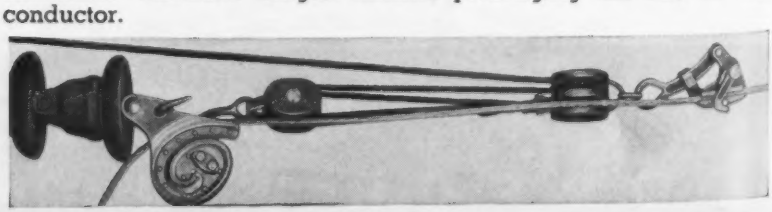


It has been approved for use on A. C. S. R. without armor tape

THE RELIABLE No. 420 Snub Deadend is made of high strength, non-corrosive aluminum alloy, is low in cost and accommodates No. 2 or No. 4 A.C.S.R.

The spiral form of this deadend for A.C.S.R. carries the snub principle to full advantage. This clamp develops approximately the full strength of the conductor and distributes the strain equally on all strands.

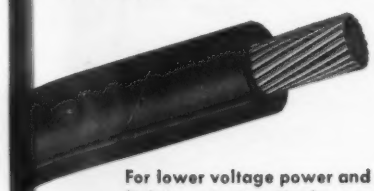
It is easy to install and has enough margin of holding power so that a moderate tightening of the clamp develops the full strength of the wire. Weighing about three-quarters of a pound, this clamp minimizes vibration fatigue strains, prolonging the life of the conductor.



Reliable ELECTRIC COMPANY
3145 CARROLL AVENUE CHICAGO 12
OVER 40 YEARS Service TO THE UTILITIES

WHY STATIONS HAVE STANDARDIZED ON OKOLITE-OKOPRENE CABLES

Okolite-Okoprene generator lead: Semicon tape protection over segmental conductor, heavy wall of Okolite insulation, metal shielding tape and non-flammable, non-metallic Okoprene sheath.



For lower voltage power and lighting circuits: Single conductor Okolite-Okoprene wire.

Multi-conductor control cables have colored Okoprene (plain or striped) for coding.

PROPERTIES	LOCATIONS	OKOLITE-OKOPRENE PROPERTIES
LONG LIFE AND RELIABILITY	All electrical circuits.	Confirming nearly a quarter-century of field experience, continuous aging tests of Okolite insulation checked at intervals in Okonite's proving ground, show practically no change in physical and electrical characteristics. Okolite oil-base insulation, applied by Okonite's strip process, is made with wild Up-river Fine Para rubber established over many years of steady use as stable and dependable. Exposure tests and service records over 13 years have proved the durability of Okoprene coverings.
ELECTRICAL STABILITY	All control, power, lighting, and switchboard circuits.	Electrical measurements made on Okolite insulation after 8 years immersion in water show the insulation resistance unchanged from the excellent values recorded in the first 6 months. Insulations made with synthetic rubbers show no such stability. Retention of Okolite's stable electrical qualities is further insured by the Okoprene sheath that seals the insulation from terminal to terminal.
HIGH DIELECTRIC STRENGTH AND OZONE RESISTANCE	Generator and transformer leads, auxiliary power circuits, test cables, etc.	Okolite's high dielectric strength is greatly increased by the use of Semicon tape over conductors operating above 2000 volts. Therefore, in addition to a-c. tests at voltages 25% greater than IPCEA requirements, all such Okolite-Okoprene cables are also given a self-imposed d-c. kenetron test at 3 to 4 times the IPCEA 60-cycle a-c. values. Internal and external ozone attack is resisted in 4 ways: (1) Okolite insulation is ozone-resistant, (2) Semicon tape prevents internal corona discharge, (3) Okoprene covering is not only ozone-resistant but (4) does not develop static discharge below 5000 volts.
MOISTURE RESISTANCE	Cables in ducts, troughs, or buried direct and wherever condensation exists.	Okolite insulation—*without any lead covering*—has been used for 20 years in submarine power cables, some of which operate at 35,000 volts. From its Okoprene sheath that cannot rot to its conductor coated with Okoloy — the lead alloy that outlasts tinning 2 to 1 — an Okolite-Okoprene cable resists attack by moisture.
HEAT AND FLAME RESISTANCE	Boiler rooms, tunnels, and other hot locations and for heavily-loaded cables.	Okolite insulation, recommended for use at 75 degrees C up to 8000 volts and 70 degrees C above 8000 volts, is suitable for heavy current loadings or for hot locations. Since equally heat-resistant Okoprene coverings will not support combustion, Okolite-Okoprene cables are also non-flammable, a feature of prime importance in station design.

LOW COST INSTALLATION AND OPERATION

The complete simplicity of Okolite-Okoprene cables reduces weights and handling problems to a minimum and eliminates corrosion and electrolysis since no lead sheath is required. Splicing and terminating methods are also greatly simplified as potheads, lead sleeves and filling compounds are unnecessary.

Okolite-Okoprene station wires and cables are available in a complete range of designs from switchboard wire and control cables to heavy, shielded generator leads of the largest dimensions. Okolite-Okoprene cables may be installed in conduit, on trays or racks, buried direct or exposed to the weather. For complete information, including current carrying capacities, dimensional data and splicing instructions ask your Okonite representative for Okolite-Okoprene Folder File or write direct to The Okonite Company, Passaic, New Jersey.

OKONITE SINCE 1878 insulated wires and cables

THE BEST CABLE IS YOUR BEST POLICY

ALLIS-CHALMERS Improved DISTRIBUTION TRANSFORMERS

Easier to Handle . . Look Better

BECAUSE THEY'RE 17-39% LIGHTER, UP TO 1/3 SMALLER

AND THE STORY behind this *improved* transformer? It's the use of new orientated electrical core steel. This material makes possible a smaller, more compact unit . . . without any sacrifice in operating characteristics or mechanical ruggedness.

Compare these *improved* distribution transformers with our former designs. You'll find the same strong welded construction . . . corrosion resistant finish . . . careful workmanship . . . and all the other features that mean long service without attention.

* * *

Send for new 12 page Bulletin 61B6159B. It contains dimensions, weights and construction details of these improved distribution transformers — from 1½ to 100 kva, 2400-15,000 v. Ask a nearby A-C representative for a copy, or write ALLIS-CHALMERS, MILWAUKEE 1, WIS. A 2402

STANDARDIZED DESIGNS

Built to meet EEI-NEMA Standards
(*Preferred types)

kva	4800 volts and below	7200 volts and up
1½-25	* PBSR	* CBSR or PBSR
37½-100	* PBS	* CBS

KEY TO TYPE DESIGNATION

PBSR—High voltage pocket bushings with low voltage stud bushings in tank wall . . . round tank.

PBS—High voltage pocket bushing with low voltage bushings in tank wall . . . semi-elliptical tank.

CBSR—High voltage cover bushings with low voltage stud bushings in tank wall . . . round tank.

CBS — High voltage cover bushings with low voltage stud bushings in tank wall . . . semi-elliptical tank.

ALLIS-CHALMERS

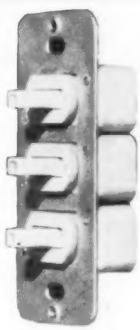
Pioneers in Power and Electrical Equipment From Generation Through Utilization

SAFLEX CONTROL SYSTEM LIGHTS THE PATH AHEAD

The Saflex lighting control system—at no additional cost—makes it possible to provide the home owner with more convenient and more flexible control of lighting.

Because the Saflex system operates on 24 volts, A.C., it eliminates the necessity of installing electric metallic tubing to the control switches. Since it is a multiple system utilizing three wire control it eliminates the use of 3 way or 4 way switches. It is, therefore, economically practical to install light control points at every entrance to every room.

The system is readily adaptable to a remote or master control system.



The Saflex control switches are 24 volt, A.C., single pole, double throw, automatic center position return, lever type.

The Saflex Relay is delivered complete with mounting bracket and is installed in the fixture outlet box or in the receptacle box. Control wires can be extended to any number of control points at a minimum of cost.

APPROVED BY UNDERWRITERS LABORATORIES

SQUARE D COMPANY

DETROIT • MILWAUKEE • LOS ANGELES

SQUARE D CANADA, LTD., TORONTO, ONTARIO • SQUARE D de MEXICO, S.A., MEXICO CITY, D.F.

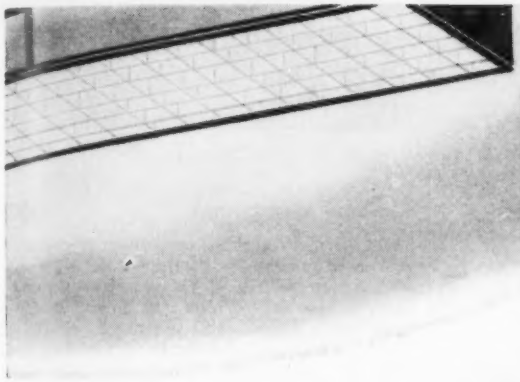
For the first time since 1941, we are able to offer you a new, complete and up-to-date catalog covering Simplex-TIREX Portable Cords and Cables. This new 68-page TIREX Catalog has just been published. It contains all the latest dimensions, weights and descriptions of the various standard sizes and types of Simplex-TIREX Cords and Cables. A complete range of sizes is covered for the various voltages. The "Cured in Lead" process is explained and there are instructions for splicing.

We will be glad to send you a copy upon receipt of a post card or a letter.

Simplex

WIRES & CABLES

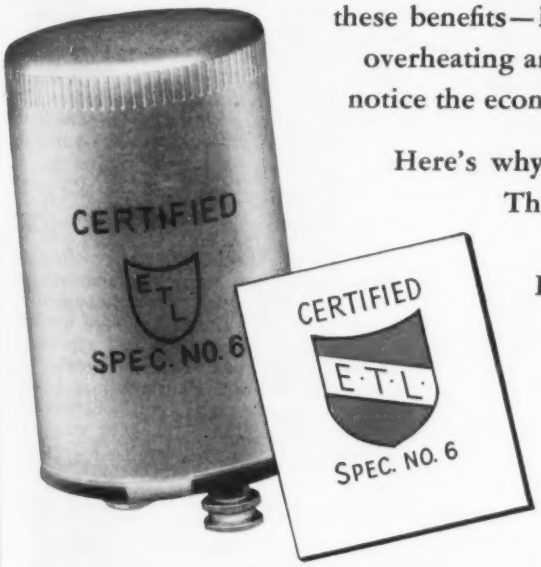
SIMPLEX WIRE & CABLE CO., 79 SIDNEY ST., CAMBRIDGE 39, MASS.



You're off to a good start

WITH Certified Starters

Certified Starters play an important role in fluorescent lighting. When your fixtures are equipped with Certified Starters, you are assured of these benefits—longer starter life, less ballast overheating and longer lamp life. You quickly notice the economy in maintenance costs.



Here's why Certified Starters are better:
They're made to rigid specifications set up by foremost lighting experts—then tested and checked by famous Electrical Testing Laboratories, Inc.

You'll assure satisfaction, give customers a good start, when you specify Certified Starters—the ones bearing the famous shield "Certified ETL".

All Fleur-O-Lier fixtures use Certified Starters

Address inquiries to any of the following manufacturers of

Certified Starters

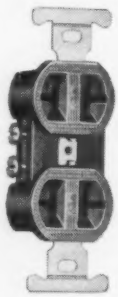
The Arrow-Hart and Hegeman Co., Hartford, Connecticut
The Bryant Electric Co., Bridgeport, Connecticut
Chatham Electronics Corporation, Newark, N. J.
Dura Electric Lamp Co., Newark, N. J.
General Electric Co., Bridgeport, Connecticut
Harvey Hubbell, Inc., Bridgeport, Connecticut
Instant Glow Starter Corporation, New York, N. Y.
Kuthe Laboratories, Inc., Newark, N. J.
The Lloyd Products Co., Providence, R. I.
Pass & Seymour Co., Syracuse, N. Y.
Sheldon Electric Co., Irvington, N. J.

BUILT TO R.E.A. SPECIFICATIONS

KEYLESS CEILING RECEPTACLES—WHITE PLASTIC—Catalog Nos. 275-3, 275-4. 660V-600V. For 3¼" and 4" round boxes. Extra ½" oversize design permits safety margin for installation. Rigid terminals—large binding head screws will take No. 10 copper wire. Light weight; advantage in shipping and handling. Not subject to mechanical stresses found in porcelain. Breakage reduced to minimum. Washer head screws furnished for quick mounting.

TOGGLE SWITCHES, T-RATED — 10 Amp., 125V, T; 5 Amp, 250V. Single pole brown bakelite, Catalog No. 400. Three way, Catalog No. 403. In ivory, Catalog Nos. 400-I, 403-I. Cup Dimensions: 1⅜" long, ⅞" wide, 1" deep. Small, compact body, for easy wiring.

DUPLEX RECEPTACLE "T" SLOT—15 Amps-125V; 10 Amps-250V. Side wired, brown bakelite, Catalog No. 300. Ivory Catalog No. 300-I. Phosphor bronze contacts for durability.



BUILT with rigid adherence to the specifications of the Rural Electrification Administration, where they apply, these Slater Lifetime wiring devices admirably fulfill the requirements of the program to electrify rural homes.

These lifetime devices are engineered and produced for long-term service under heavy usage. Individual packing minimizes stock loss for wholesalers, contractors and dealers. Distributed only through wholesalers.

All items are listed and approved by Underwriters' Laboratories, Inc.

Slater
ELECTRIC & MFG. CO.
WOODSIDE, NEW YORK
Lifetime wiring devices

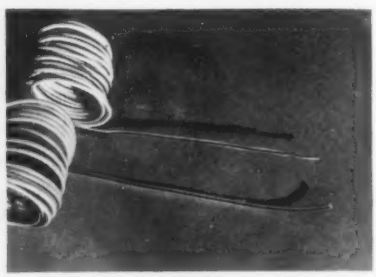
PRODUCT NEWS

Molding Compounds (300)

G-E is marketing seven standard grades of silicon rubber molding compounds, all stocks claimed to withstand temperatures ranging from minus 70° to plus 520° F and to have excellent electrical and chemical properties. Stocks available include both molding and extruding compounds in white and brown.

Thermoplastic Tubing . . (301)

Integrally extruded contrasting colored striping is a feature of the thermoplastic tubing recently developed by William Brand & Co. According to the manufacturer, this process insures permanency of identification and precludes possibility of impairment of the dielectric factor of tubing or insulated wire.



25-Kvar Capacitor (302)

General Electric has announced that a new low-loss Kraft paper has raised the ceiling rating for large power factor capacitors to 25 kvar. Size of the new 25-kvar. unit is about 58% larger than the 15-kvar. capacitor. The 67% increase in capacity is secured chiefly because the new paper has 20% lower temperature rise than the dielectric previously used, according to the announcement.

Dielectric Capacitors (303)

A line of plastic dielectric capacitors, claimed to have electrical characteristics superior to mica, has been announced by United Condenser Corp. They are available in a wide range of voltage and capacitance and can be furnished to close tolerances and in multiple sections. Housings may be hermetically sealed metal cans, hermetically sealed glass or ceramic tubes, or wax-sealed cardboard tubes.

Soldering Iron (304)

Lenk Mfg. Co. has a new soldering iron with a metal-clad heating element, fin-type heat dissipators to keep the handle cool and a heavy-duty cord. This iron is one piece, chrome plated, swaged tube and operates on 110 volts a-c, 75, 100 or 150 watts.

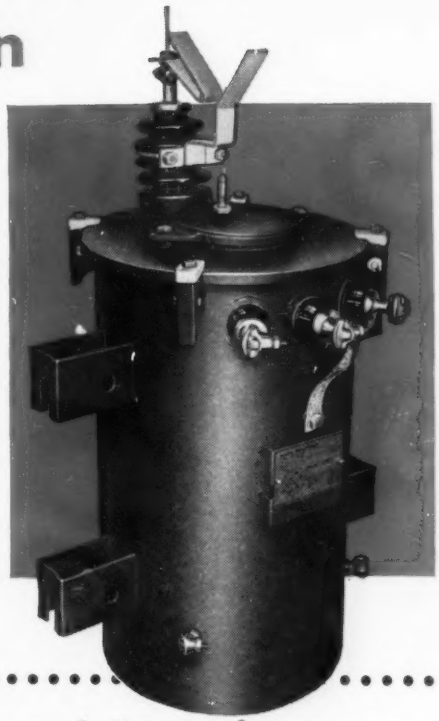
Motor Line (305)

Allis-Chalmers has a line of improved, totally enclosed, fan-cooled, wound-rotor motors, built with an improved tube-type, air-to-air heat exchanger, which permits reduction in size from older models.

Performance *plus* Protection

No matter what your requirement may be, Wagner can supply the *right* rural-line transformer for your need. Type HEF-5, illustrated at right, features a double "bird-proof" gap to provide surge protection and an internal fuse to form a protective link between the transformer and the high voltage line. When the double gap and internal fuse are combined no other surge protection or transformer fuses are required.

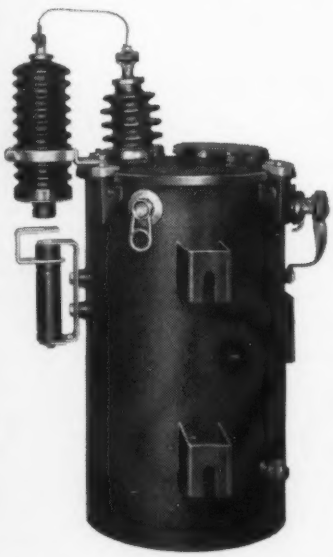
Wagner Rural-Line Transformers are nationally known for their high standard of quality and performance. They are establishing enviable records in the field, upholding the Wagner reputation for dependability earned during our half-century of designing and building distribution and power transformers.



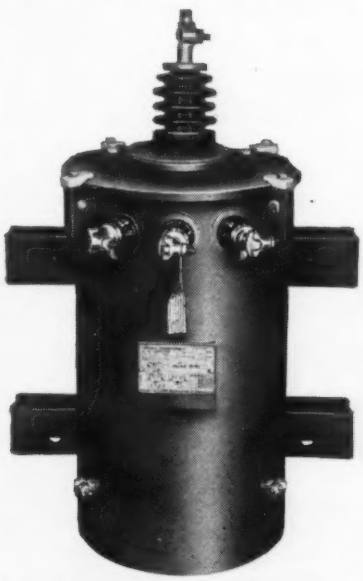
Wagner makes a complete line of Rural Transformers

Get performance plus protection by selecting the type that meets your requirements from Wagner's complete line. Full information on Wagner Rural-Line Transformers is given in Bulletin TU-1C. Write for your copy today.

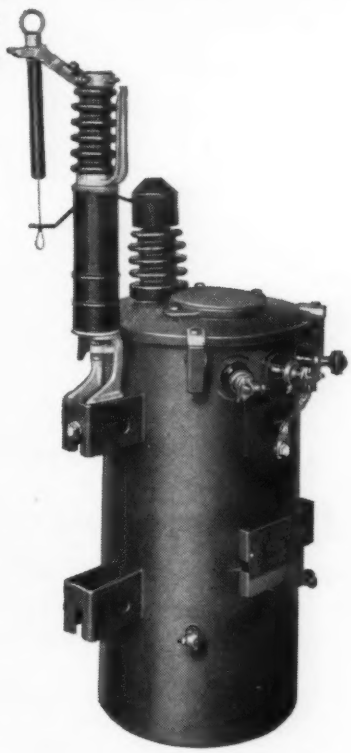
Wagner Electric Corporation
6381 PLYMOUTH AVE., ST. LOUIS 14, MO., U. S. A.



Type HEF-3: Completely Self-Protected Rural-Line Transformer. De-ion Gap on high-voltage side provides surge protection; secondary circuit-breaker provides overload protection.

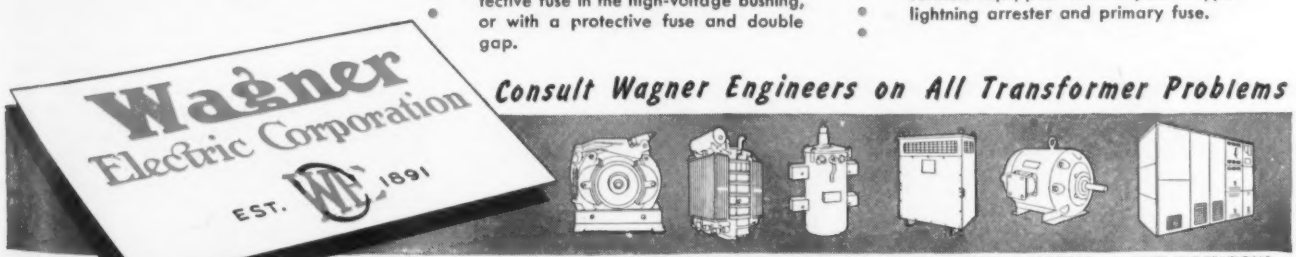


Type HEF: Conventional Rural-Line Transformer. Also available with protective fuse in the high-voltage bushing, or with a protective fuse and double gap.



Type HEF-7: Protected Rural-Line Transformer. Equipped with expulsion-type lightning arrester and primary fuse.

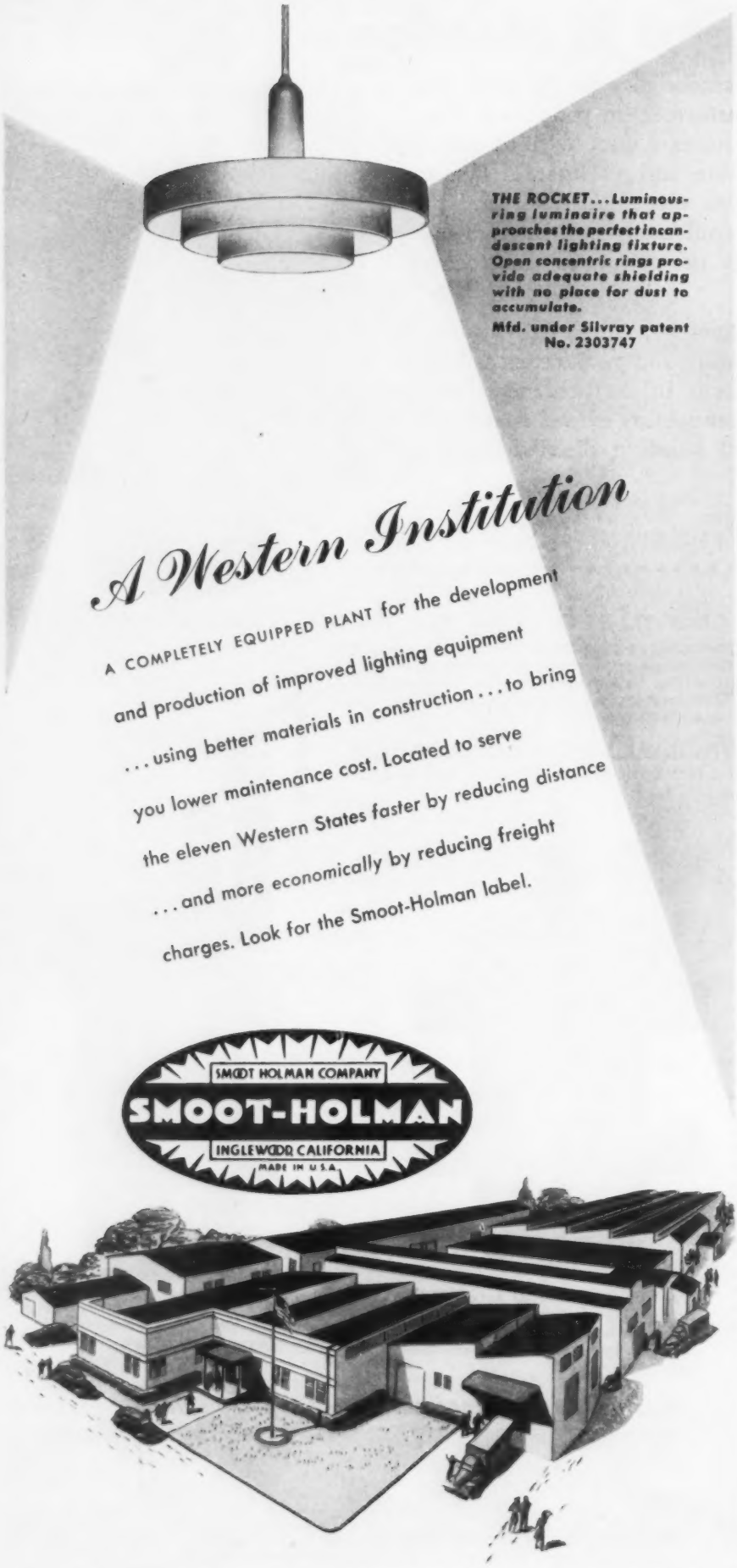
Consult Wagner Engineers on All Transformer Problems



BRIDGE BRAKES • POWER AND DISTRIBUTION TRANSFORMERS • MOTORS • UNIT SUBSTATIONS

ELECTRICAL AND AUTOMOTIVE PRODUCTS

T48-6


THE ROCKET... Luminous-ring luminaire that approaches the perfect incandescent lighting fixture. Open concentric rings provide adequate shielding with no place for dust to accumulate.
Mfd. under Silvray patent No. 2303747
A Western Institution
A COMPLETELY EQUIPPED PLANT for the development
and production of improved lighting equipment
... using better materials in construction ... to bring
you lower maintenance cost. Located to serve
the eleven Western States faster by reducing distance
... and more economically by reducing freight
charges. Look for the Smoot-Holman label.
SMOOT HOLMAN COMPANY
SMOOT-HOLMAN
INGLEWOOD CALIFORNIA
MADE IN U.S.A.
Offices in Principal Western Cities—Branch and Warehouse in San Francisco

Kiln (306)

The K. H. Huppert Co. is offering a tunnel kiln for small-batch production work, firing of ceramic parts and heat treating of small parts. The electric heating element provides a maximum temperature of 2,200°F. This kiln is the pusher type, with small refractory trays pushed through the inside of the 33-in. firing chamber by means of a variable-speed drive. The firing zone is 10 in. long and the tray size is 2⅝ in. by 3¾ in. Operates on single-phase, 110 or 220-volt a-c and has power consumption of 2 kw., according to the announcement.

Carbon Arc Torch (307)

Westinghouse is offering the Flexarc carbon arc torch for brazing, soldering and supplying heat for light forging, preheating before welding and tempering operations. Each torch comes complete with two 10-ft. extra flexible welding cable leads attached; one pair ¼ x 6-in. carbon electrodes; one pair 3/8 x 6-in. carbon electrodes. Leads have bayonet attachment plugs to fit the company's WT Midget Marvel and Limited Input welders.

Farm Pond Fish Screen (308)

Electric Fish Screen Co. has developed a portable electronic generator unit for farm fish ponds. This new generator is used in conjunction with the company's free-swinging electrode system to fence outlets and inlets of small streams. It is said to operate on the closed-circuit continuous-load principle and to produce a series of mild underwater shock waves which turn or control fish.

Water Trough De-icer (309)

Westinghouse is making a floating water heater to de-ice stock watering troughs. According to the announcement, the outer surface never gets hotter than "warm." The de-icer is a 2¼-in.-thick disk, 10 in. in diameter, containing a 500-watt heating element, thermostatically controlled. It floats on the surface of the water and the rubber-covered cord plugs into any 110/115-volt outlet.

Motor (310)

A single-phase Life-Line capacitor-start, induction-run, squirrel-cage motor is available from Westinghouse in ratings of ¾, 1, 1½, 2, 3, 5 and 7½ hp. It is of all-steel construction; uses the capacitor for starting only. The starting switch or relay disconnects the capacitor as the motor approaches full speed; it then operates as induction run motor.

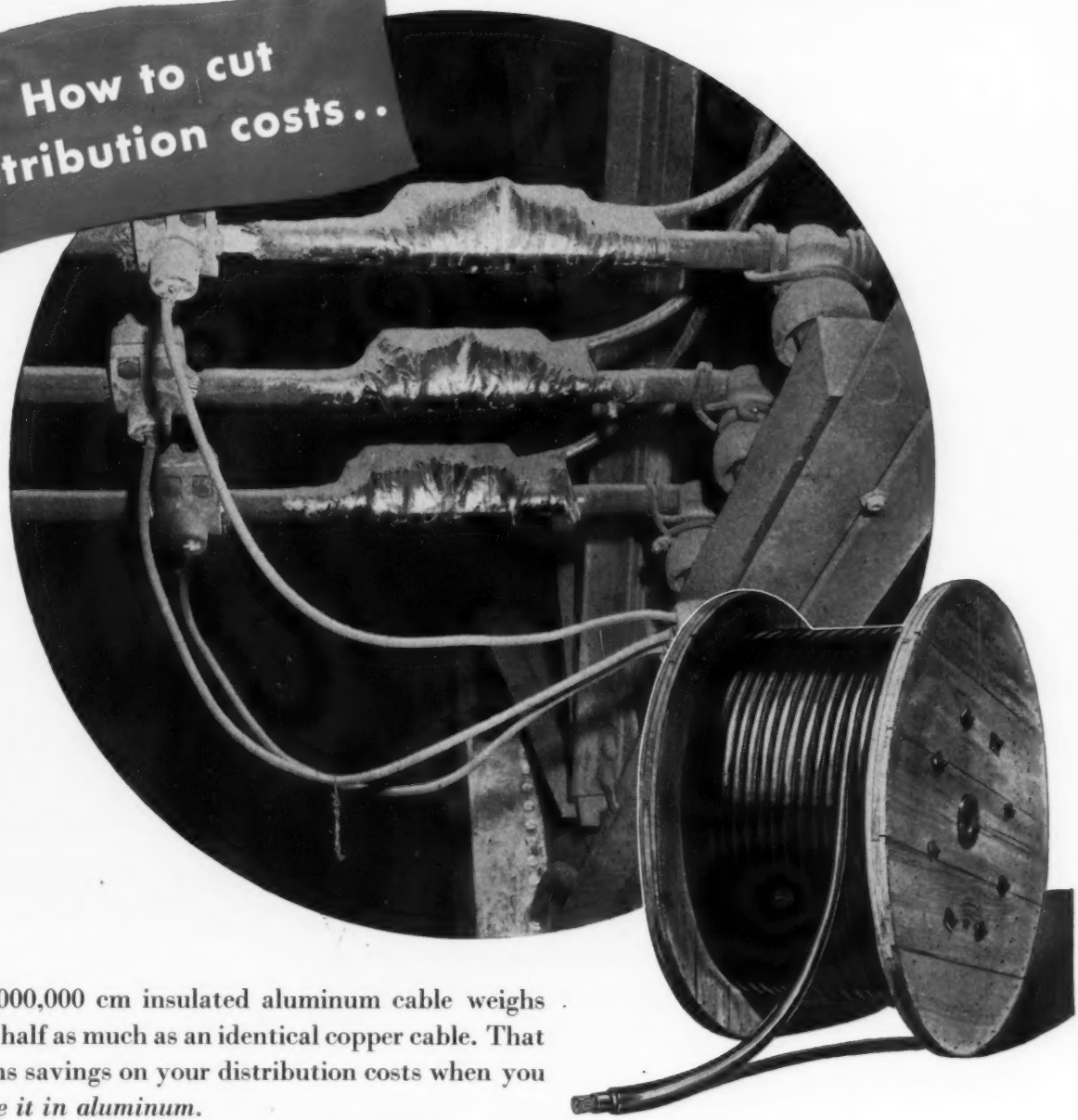
Disconnecting Switches (311)

A new line of group-operated disconnecting switches for 115- to 230-kv. outdoor service has been announced by General Electric. Designated Type RF, this switch features silver-to-silver line-pressure contacts, a simplified operating mechanism and complete elimination of current-carrying braids. It can be furnished for mounting in other than the standard upright position if required.

Connector (312)

Tomic Sales & Engineering Co. is offering the Tomic No. 333BX cable connector to supplement its No. 100 cable connector and No. 200 range or service cable connector.

How to cut distribution costs..



A 1,000,000 cm insulated aluminum cable weighs only half as much as an identical copper cable. That means savings on your distribution costs when you *figure it in aluminum.*

Wire and cable of Alcoa E.C.* Aluminum, insulated and sold by leading manufacturers under their own trademarks, gives you everything you want in a conductor. No problems of conductivity, of conduit layout, or of joints and terminals. Figure it in aluminum and get lower over-all job costs. Your wire and cable manufacturer can supply you now. ALUMINUM COMPANY OF AMERICA, 2132 Gulf Building, Pittsburgh 19, Pennsylvania.

*E. C.: *Electrical Conductor* Aluminum

INSULATED

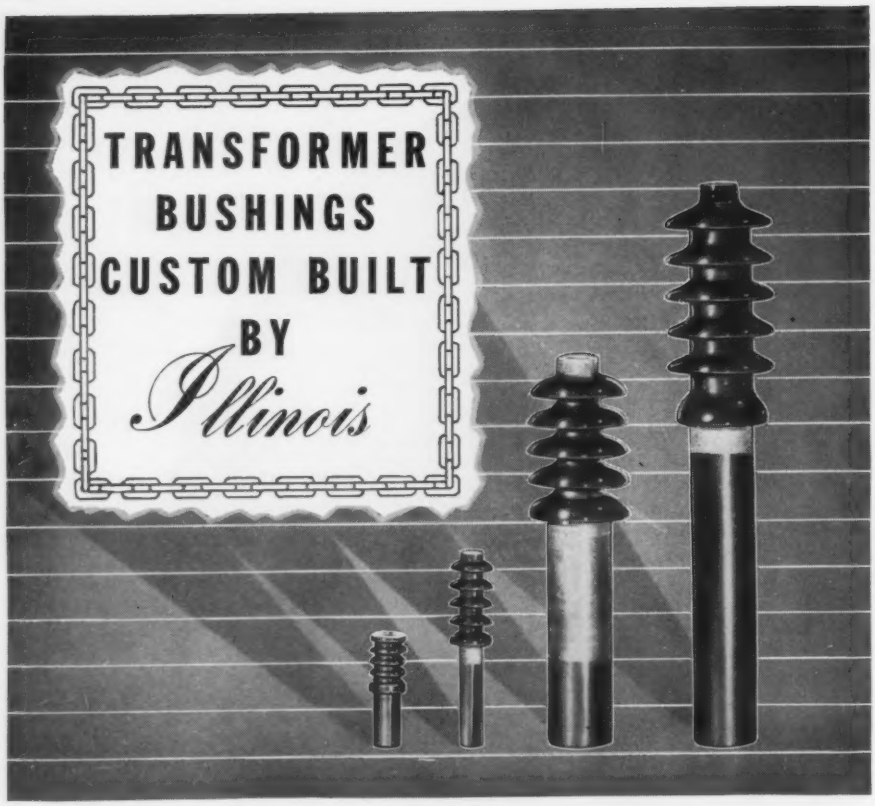
Aluminum

WIRE AND CABLE

ALCOA EC ALUMINUM

ALCOA

FOR ELECTRIC WIRE AND CABLE



A chain is only as strong as its weakest link. Prevent weak links in your product by using ILLINOIS bushings produced to meet your engineers' most exacting specifications.

ILLINOIS' thorough control of production methods results in the manufacture of porcelain bushings of high dielectric and great mechanical strength, with the utmost in dimensional accuracy. Careful kiln drying and firing, at constant temperatures, prevent internal stress.

These bushings can be standard glaze or radio interference-proof glaze. Dry type bushings are produced for all voltages up to 34.5 kv. Gasket seats are smooth and ground when required.

★

Complete Uniformity
Exact Dimensions
High Dielectric Strength
High Mechanical Strength

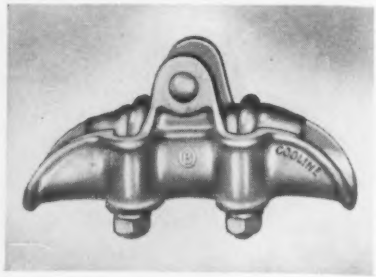
★

Specify Illinois Porcelain
for Dependability and Economy

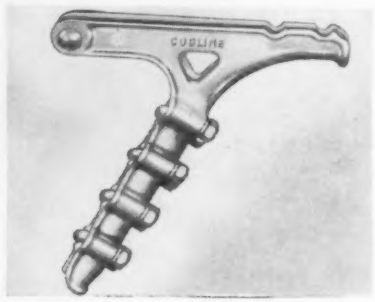
ILLINOIS
ELECTRIC PORCELAIN CO.
MACOMB • ILLINOIS

Suspension Hardware (313)

Ohio Brass Co. has utilized the non-magnetic quality of aluminum alloy in a new line of suspension and strain hardware, called the "Cooline." Advantages claimed by the manufacturer are: direct power savings by almost complete reduction of hysteresis



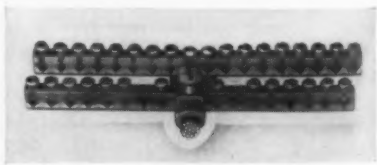
and eddy current losses; reduction of pitting or burning of conductor within clamp; minimizing of low-temperature annealing of conductors at hardware points, since temperature of conductor within clamp is lower



than conductor in open air; by reducing hazard of conductor annealing due to excessive heat at clamps, transmission line amperages can be increased until other restricting loss factors are reached.

Neutral Bar (314)

Ilsco Copper Tube and Products Co. has a neutral bar which it claims furnishes exact length and number of outlets for a variety of installations. Wires may be disconnected by a twist of a screwdriver, according to the manufacturer, and each outlet is properly

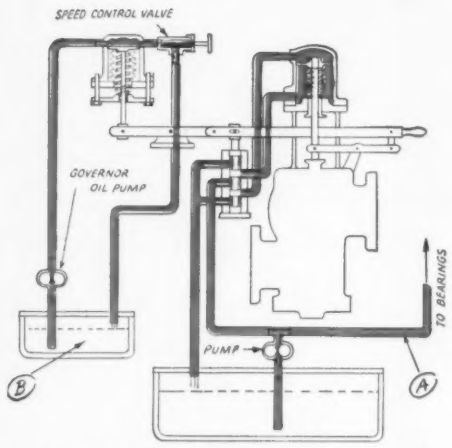


identified so wires may be traced quickly. The bars have been approved by Underwriters'. Approvals have been given on 70 amp. for a maximum of 14 outlets; 125 amp. for a maximum of 30 outlets and 225 amp. for a maximum of 42, all plus the line load.

Socket (315)

Neoline Inc. has a new neoprene-sealed electric light socket which it claims is waterproof, weatherproof and vaporproof. This No. 350 may be purchased in individual units or strung in sets, with each socket wired independently; is available in any standard color.

CASE 1048—STOPPING RUSTING, LACQUERING, SLUDGING IN STEAM TURBINES.



VARIABLE-SPEED OIL-RELAY GOVERNOR

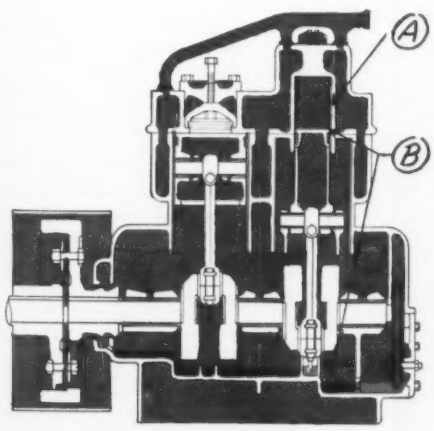
Charges of inhibited Calol OC Turbine oil in various size turbines gave service many times longer than normally obtained with straight-mineral oils. Use in large and small units ... ring-oilers, circulating oil lubricating systems and oil-actuated governor relay systems. Comes in five grades: 5, 9, 11, 15, 19.

A. Contains highly effective corrosion inhibitor and has excellent metal-wetting ability. Keeps moisture in oil systems from contacting metal.

B. Oxidation inhibitor resists deterioration of oil and sludge formation caused by heat, moisture, air, dirt ... prevents plugging of oil lines.

Calol OC Turbine Oil in regular service showed no increase in acidity after several years ... turbine parts remained in same condition as when installed ... water and solid contaminants separated readily from oil in centrifuging or filtering systems.

CASE 1045--MINIMIZING OIL OXIDATION AND DEPOSIT TROUBLE IN AIR COMPRESSORS.



TWO-STAGE, 2 CYLINDER AIR COMPRESSOR

In air compressors of all types and sizes, heat-resistant Calol Multi-Service Oil materially reduced deposits on discharge valves, cylinders, bearings and in crankcases. Comes in six viscosity grades: 45X, approximately SAE 10; 50X, SAE 20 medium; 55X, SAE 20 heavy; 65X, SAE 30; 75X, SAE 40; 85X, SAE 50.

A. Detergent compound keeps parts cleaned of gum and lacquer and prevents ring sticking . . . provides constant lubrication on hot spots.

B. Oxidation inhibitor prevents formation of sludge and other deposits caused by air, extreme heat, moisture, dust and other contaminants.

Has high metal-adherent quality - maintains film of oil in idle machines which prevents starting wear and protects against rusting.

Calol Multi-Service Oil will correct gum and lacquer problems in many machines - in air compressors, Diesel and natural gas engines, enclosed gears, bearings.

Trademarks, "Calol," "RPM," Reg. U. S. Pat. Off.

Standard Fuel and Lubricant Engineers are always at your service. They'll gladly give you expert service—make your maintenance job easier. Call your local Standard Representative or write Standard of California, 225 Bush St., San Francisco 20, California.

RPM CALOL

FOR EVERY NEED A STANDARD OF CALIFORNIA JOB-PROVED PRODUCT

USE BRIEGEL
ALL-STEEL
INDENTER-TYPE FITTINGS!

Cross Section Showing Indentations.

Select the best, insist on Briegel All Steel Fittings, the only approved Indenter type connectors and couplings for thin wall conduit tubing. You will not only find that Briegel Indenter Fittings are easier and faster to use, but also make neater, stronger connections. Two Easy Squeezes and they're set. Start using Briegel Fittings today. Have more satisfied customers — more profits from each job.

DISTRIBUTED BY

The M. B. Austin Co., Northbrook, Ill.; Clayton Mark & Co., Evanston, Ill.; Clifton Conduit Co., Jersey City, N. J.; General Electric Co., Bridgeport, Conn.; The Steelduct Co., Youngstown, Ohio; Enameled Metals, Pittsburgh, Penn.; National Enameling & Mfg. Co., Pittsburgh; Penn.; Canadian General Electric Company, Ltd.

All B-M Fittings Carry the Underwriter's Seal of Approval and Canadian Standards Ass'n Approval No. 8275.

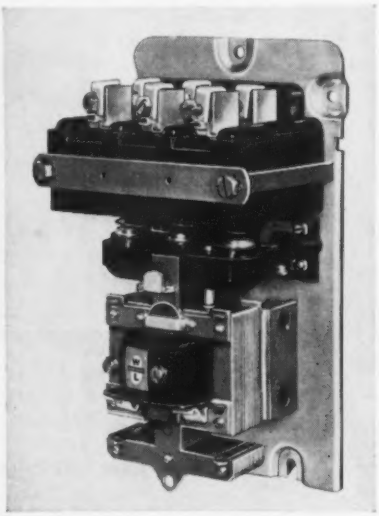
NEATER • FASTER • STRONGER • APPROVED.

BRIEGEL METHOD TOOL CO.
GALVA, ILLINOIS

Contactors (316)

Newly designed Size 2 Bulletin 4452 and Size 3 Bulletin 4453 a-c solenoid contactors have been announced by Ward Leonard Electric Co. Intended primarily for use in a-c motor controllers, these contactors are suitable also for application in resistive heating controls, lighting controls, etc., for remote and automatic load switching. Features listed by the manufacturer are: compact unit construction, complete accessibility of parts, built-in solderless connectors, massive double-break silver contacts; simplicity of design; long trouble-free operating life.

Size 2 and 3 units have maximum ratings of 25 and 50 hp. respectively on 450-550 volts, 3 phase, 60 cycles. Standard operating coils with front-connected terminals are available for 110-, 220-, 440- and 550-volt operation on 25, 50 or 60 cycles.



Recloser (317)

A G-E relayed automatic recloser designed to improve service and reduce operating costs on rural lines is available with continuous current ratings of 5, 10, 15, 25, 35 and 50 amp. and with interrupting ratings 25 times the continuous rating. It may be used on 2,400- to 15,000-volt circuits. It offers a choice of two operating functions, either two instantaneous openings plus two time-delay openings to lock open, providing wide-range coordination to fuses; or two instantaneous openings to lock closed, providing extended coordination to fuses over an even greater range of current values. It may be converted in the field. Weight is 70 lb.

Dry-Type Transformers (318)

Westinghouse has a new line of dry-type transformers equipped with built-in primary circuit breakers and thermal protection against overloads for supplying industrial lighting and small power circuits from industrial power circuits. Complete in themselves, these transformers may be connected directly to open or conduit wiring. Ratings are available from 3 through 50 kva. for 240 to 120-240 volts, 480 to 120-240 volts or 600 to 120-240 volts, single phase, 60 cycles.

Aluminum Reflectors (319)

Edwin F. Guth Co. reports that Alzak aluminum reflectors and louvers are available for its Futurliters and Trucolites. A special glass diffusing bottom may be had for Trucolites.

GENERAL ELECTRIC REPORTS ON NEW 1467 PYRANOL* THAT SIMPLIFIES HANDLING

All General Electric Pyranol filled transformers are now supplied with an improved Pyranol, designated as No. 1467.

Pyranol is an insulating liquid, introduced by General Electric in 1932, which permits, under the National Electrical Code, the indoor installation of liquid-filled transformers without fireproof vaults. It is chemically stable and possesses all the necessary operating characteristics of a good insulating liquid, but unlike mineral oil, it will not form explosive or flammable gases, *and will not burn, oxidize, or sludge.*

The chemical composition of the original Pyranol has been improved so that, now, equipment insulated and cooled with the new liquid can be handled in the same way, in case of failure, as would oil-filled equipment. The principal difference, compared to the older No. 1488 Pyranol, is that the new No. 1467 neutralizes the hydrogen-chloride gas remaining in the liquid after an internal arc. This avoids any possibility of the formation of hydrochloric acid within the transformer.

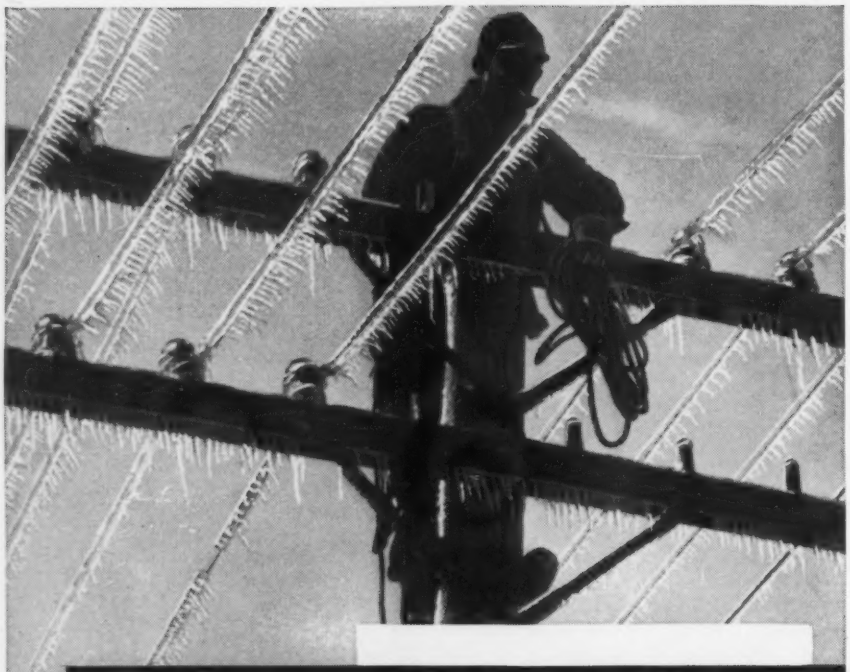
This same improved Pyranol is also standard for Pyranol voltage regulators, and Pyranol filled interrupters and dead-break switches. Therefore, only one grade need be stocked for all Pyranol filled distribution equipment.

No. 1467 Pyranol is listed by the Underwriters Laboratories, Inc. It can be used in any proportions to replenish 1488-filled apparatus, although to obtain characteristics of complete neutralization, 100 per cent of No. 1467 must be used. For pricing information, consult our nearest Apparatus Office or write *Apparatus Department, General Electric Company, Schenectady 5, N. Y.*

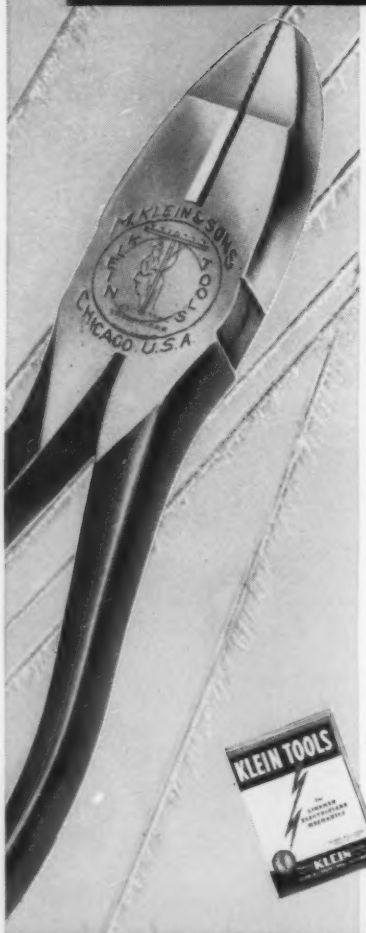
* *Reg. U.S. Pat. Off.*

"YOU CAN'T BURN PYRANOL"

GENERAL ELECTRIC



KLEIN PLIERS!



. . . PREFERRED BY LINEMEN

Wherever there are linemen . . . whatever the job—tough or routine—you'll find Klein Pliers.

There's good reason for this widespread preference that began when the electrical industry was in its infancy and has continued on through the years.

Linemen know they can depend upon the quality and performance of Klein Pliers. Drop forged from the finest alloy steel, each pair is individually tempered and tested—has the proper balance—just the right spring to the handles to minimize hand fatigue. A fitted hinge keeps jaws perfectly aligned—the carefully matched knives cut swiftly, surely and stay keen for years.

The complete Klein line includes pliers for every use. Your supplier will fill your order as quickly as possible.

Ask Your Supplier
Foreign Distributor: International Standard Electric Corp., New York

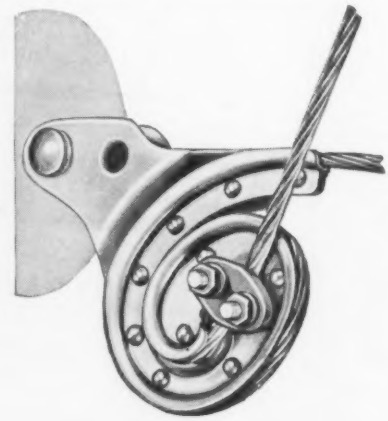
A copy of the Klein Pocket Tool Guide, showing the Klein line and containing valuable tool information, will be sent on request.

Since 1857

Mathias KLEIN & Sons
Established 1857 Chicago, Ill., U.S.A.
3200 BELMONT AVENUE . CHICAGO 18, ILLINOIS

Deadend (320)

Reliable Electric Co.'s new No. 420 snub deadend is made of high-strength, non-corrosive aluminum alloy, accommodates No. 2 or No. 4 A.C.S.R. According to the manufacturer, the spiral form carries the snub



principle to full advantage; the clamp is easy to install and has enough margin of holding power so that a moderate tightening of the clamp develops the full strength of the wire. Weight is about ¾ lb., the announcement stated.

Expanding Earth Anchor (321)

Pieper-Lillard Inc. is making an all-steel two-piece expanding earth anchor. This anchor has one-piece, truss-type, expanding blades, and a reinforced base plate. The blades are attached to the base plate with shear bolts which are severed with the first blow of the spreader. Successive blows of spreader are directed onto upper edges of blades forcing them through a natural arc into undisturbed earth.

Hanger Transformers (322)

General Electric has a new line of hanger transformers for suspension-type luminous-tube signs. They incorporate a built-in low-voltage junction box having a primary pull switch mounted on the cover. A 6-ft. primary cord set is furnished and consists of three conductors with 2-prong plugs and a separate ground lead. Also supplied are secondary leads of GT cable, 30 in. long. Enclosing cases are narrow.

Waffle-Type Fixture (323)

The Linolite Series 22, available from Frink Corp., is a 49-in. waffle-type fixture available with two, three or four lamps for ceiling or hanger mounting, singly or in continuous runs, in combination with matching incandescent downlight boxes.

Indicator Light (324)

An indicator light, Type Q, available from Cannon Electric Development Co., is for radio broadcasting stations, film studios and applications where controlled warning lights are required. It comes in 24 volts, 15 cp. or 115 volts, 10 watts.

F Lamp Ballasts (325)

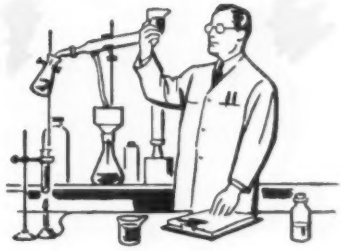
The New York Transformer Co. has introduced a line of fluorescent lamp ballasts available in more than 30 standard types.

Shell Research developed this

SHELL TURBO OIL

to help extend the running time of turbines

Weak oils can cut down turbine efficiency



Likely you've seen what happens—how ordinary oils oxidize, break down into sludge, "gum up the works"—even cause rust. Result: shorter running time and higher operating costs.

Shell's answer: a doubly fortified lubricant

Shell Research specifically developed an oil for turbine use—Shell Turbo Oil. To build this oil, Shell selects only crude stocks naturally high in oxidation stability—sludge resistance. Then, with Shell-developed additives, Shell Turbo Oil is doubly fortified. Once to build up its naturally high resistance to oxidation. Again to assure exceptional rust-preventing quality.

What you as a Shell Turbo user can expect

Little or no trace of sludge, no rust, no breakdown in the oil. In fact, Shell Turbo Oil has been delivering exactly that kind of lubrication performance in all types of installations—and always to the end of extending the running time of turbines.

SHELL

ARE YOU ABSOLUTELY SURE YOU ARE GETTING ALL THAT'S NEW IN LUBRICATION?

Your Shell Lubrication Engineer can make a complete study and analysis of your plant and machines . . . give you engineering counsel, advice on new lubricants and their application . . . help you set up schedules and controls for each and every machine. For that kind of service, call in your Shell Lubrication Engineer.

for High Accuracy and Stability...

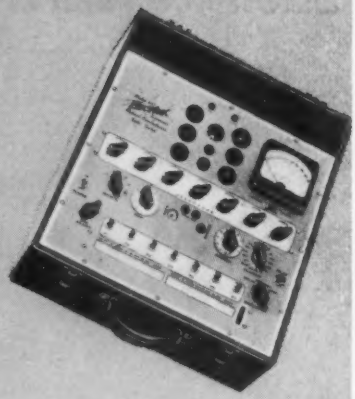
DRIVER-HARRIS ALLOYS

The fundamental role performed by precision resistors in the testing of radio tubes, demands that only resistance materials of the highest electrical stability be used in their construction.

For this reason, the precision bobbins employed by Hickok in its quality tube testers are wound with Driver-Harris MANGANIN, ADVANCE*, and Nichrome*.

D-H Manganin, for example is ideally suited for use where extreme accuracy must be obtained without error due to temperature change or voltage generated by thermal e.m.f. against copper. Advance, in its finer sizes, has a negligible temperature coefficient of resistance combined with high resistivity, making it extremely useful for winding precision resistors which must retain stable resistance values over a wide temperature range. Nichrome and Nichrome V enable large values of resistance to be wound on very small bobbins.

If your resistors demand high electrical stability, sensitivity and permanence, have Driver-Harris supply the resistance wire you need.



Driver-Harris COMPANY

Stocked for the Coast Trade at: ANGUS-CAMPBELL, INC.

235-241 San Bruno Ave., San Francisco • 449 So. San Pedro St., Los Angeles • 2122-4th Ave., Seattle

Main Office and Plant: HARRISON, NEW JERSEY

*T. M. Reg. U. S. Pat. Off.

PLANNED LIGHTING

Adequate lighting for any area requires the tools with which to work. ABolite offers you a complete line of reflectors to meet every illumination problem. They are finished in a special new porcelain enamel that gives higher reflective quality. A few typical shapes are illustrated. Other types, including special DUO-MOVE and easy-detachable units, are shown in our specification sheets. Plan now to meet future lighting problems with ABolite—the "Old ReliABle" reflectors.

SOLD ONLY THROUGH WHOLESALERS

THE JONES METAL PRODUCTS CO.,
West Lafayette, Ohio

ABolite REFLECTORS
PORCELAIN ON STEEL

Industrial Spotlight (326)

Westinghouse has announced that its new industrial spotlight is powerful enough to illuminate clearly welding, cutting or brazing work when viewed through a No. 10 welder's glass before striking the arc. One of these spot lights casts a small-diameter circle of light of from 2,500 ft.-candle brilliance when placed 3 ft. from the work to 1,000 ft.-candles when located 6 ft. away. Two or more lights may be used for any application requiring a small area of very high illumination. The spot light uses a 6-volt, sealed-beam type of lamp, operated from a transformer built into the light housing, the complete assembly weighing approximately 5 lb. It may be mounted at any angle on some convenient 1-in. pipe or on its own stand.

F Unit (327)

A heavy-duty, two 40-watt fluorescent industrial lighting unit announced by Mitchell incorporates the "twin turret" lampholder, claimed to eliminate broken sockets and falling lamps. The unit is of all steel construction; mounts singly or end-to-end, flush or suspended on chains, rods or conduit. Four models provide choice of baked enamel or porcelain enamel reflector, with or without instant-start feature. Brick-type U.L. and E.T.L.-approved ballasts are used, the manufacturer reports.

Prismatic Lens Unit (328)

Guth has a prismatic lens Hy-liter using 8-in. Corning Lenslite glass bottoms. This model is made in recessed or surface types, for 150-watt L.F. lamps.

Sign Transformer (329)

A lightweight transformer for window hanging luminous tube signs is being produced by Acme Electric Corp. It's over-all dimensions are 9¼ in. long, 3 9/16 in. wide, 3⅞ in. high.

Heater Control (330)

Westinghouse has announced an automatic thermal protection control for all its electric heaters produced since 1945. Called the Safe-Temp, the new control is designed to replace the regular temperature relief valve which releases water from the tank to relieve pressure from overheating. When the Safe-Temp is used, electric current to the water heater is shut off automatically if the water temperature exceeds safe limits, the manufacturer states.

Safety Seat (331)

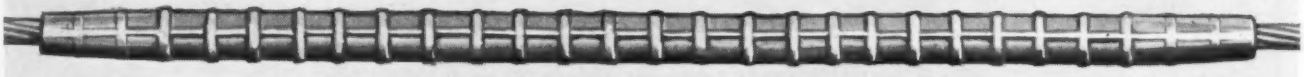
Buckingham is producing an industrial safety seat with shoulder harness. The equipment includes a rigid seat that hooks into a saddle; chest harness to be attached to a clamp well up on the supporting rope or cable; belt of 4-ply cotton webbing, moisture proofed and mildew resistant and fitted with both a ring and snap fastener for carrying tools and accessories.

Wire Stripper (332)

Aircraft-Marine Products is offering a new pocket-size wire stripper and wire cutter covering the wire sizes 22 to 10. It incorporates built-in wire cutter, serrated plier jaws and stud size gage.

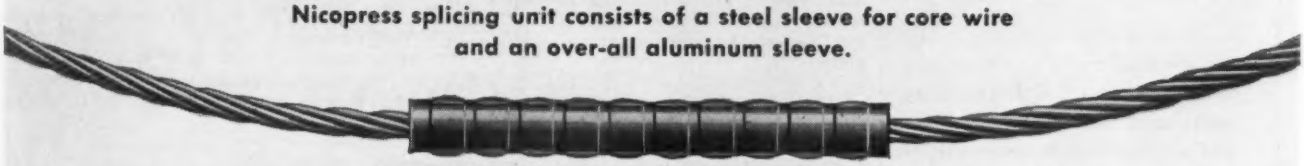
Nicopress SLEEVES for A·C·S·R·

WILL GIVE YOU PEAK PERFORMANCE!

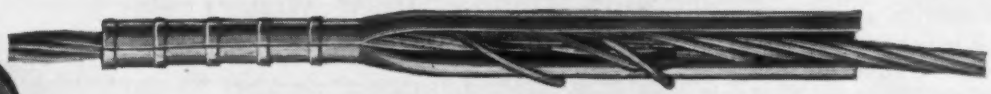


COMPLETED LINE SPLICE

Nicopress splicing unit consists of a steel sleeve for core wire and an over-all aluminum sleeve.



COMPLETED JUMPER SPLICE



REPAIR SLEEVE
(Partially Completed)

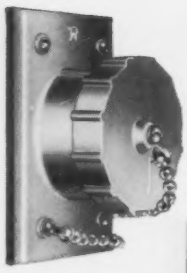
The National Telephone Supply Company

5100 SUPERIOR AVENUE • CLEVELAND 3, OHIO

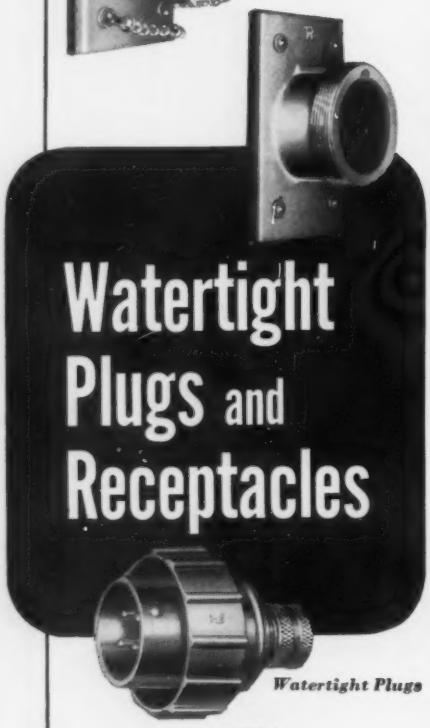
Canadian Mfr.—N. SLATER CO., LTD., HAMILTON, ONT., CANADA

Export Distributor—INTERNATIONAL STANDARD ELECTRIC CORP., NEW YORK, N. Y.

THE NATIONAL TELEPHONE SUPPLY COMPANY



Receptacles for FS-FD Pylet bodies



Watertight Plugs

WITH

TRIPLOC CONTACT UNITS

• These substantially built plugs and receptacles are equipped with Triploc contact units and are watertight for use as floodlight connections or for any other type of portable electrical equipment where weather protection is needed. Types include 1, 2, 3, 4, 6, and 8 pole units. Receptacles are galvanized cast iron with brass cap. Plugs are cast aluminum alloy with threaded nut and rubber bushing cord grip. Female contact units can be mounted in plug shell as well as in receptacle housing, as all contact units are interchangeable and reversible. For any type of outdoor plug and receptacle connections refer to your Pylet Catalog for complete listings.

SINCE 1897

THE PYLE-NATIONAL COMPANY

1364 N. Kostner Avenue, Chicago 51, Illinois

West Coast Office: 512 Hobart Building, San Francisco 4

BULLETINS ETC.

Mercury Vapor Lamps (333)

Sixteen types of mercury vapor lamps are described in a new 24-page booklet announced by Westinghouse Electric Corp. This booklet contains information on electric discharge through vaporized mercury; technical data for the 16 types of vapor lamps available; spectral radiation characteristics of vapor lamps at different arc pressures; auxiliary equipment available; operating characteristics of vapor lamps; lamp construction; lamp life and lumen maintenance; effect of ambient and lamp temperatures on lamp life; and application information.

Voltage Regulator (334)

Operating and construction features of the Allis-Chalmers transformer-type DFR 5/8 % step feeder voltage regulator are described in a new 24-page illustrated bulletin released by the company. The DFR regulators are built in 2,400-, 4,800- and 6,900-volt, single-phase ratings in a large number of standard sizes to provide ±10% regulations. How low excitation current, low over-all maintenance and close, simple control are attained is portrayed and diagramed in this new bulletin.

Cords and Cables (335)

Simplex Wire & Cable Co. has issued a 68-page two-color catalog covering the entire line of standard Simplex-Tirex portable cords and cables. The catalog, in addition to giving usual weights and dimensions, contains a description of the Simplex "cured in lead" process. Complete information on splicing is given.

Instruments (336)

Precision instruments for industry and utility are described in a new catalog issued by Associated Research Inc. Technical information and engineering data in regard to insulation and ground resistance testing, and insulation breakdown testing are included. Other instruments shown are ohmmeters, ammeters, soil resistivity meters, limits bridges, transformers and tachometers.

F Fixtures (337)

All-bright Electric Products Co. has prepared a data sheet on the latest in its line of fluorescent lighting fixtures. This unit has an over-all depth of from 3½ to 4¼ in.

Connectors (338)

Jasper Blackburn Products Corp. has issued for the first time since the start of the war a complete new catalog of its line. Various new wiring connectors are featured, as well as improvements made on other standard items. The catalog also contains information, not heretofore available to users, on the various products shown.

Unit Heaters (339)

A 16-page catalog, EC-4, issued by Electromode Corp., describes the company's line of unit heaters from 1,500 to 60,000 watts. It is illustrated with installation pictures, heaters, controls and wiring diagrams, and contains a heating analysis sheet to assist in solving industrial heating problems.

Catalog (340)

Federal Electric Products Co. has issued its 1948 Federalog, catalog of its line, including motor controls, safety switches, service equipment, circuit breakers, panelboards, switchboards and bus duct.

Data Book (341)

DuPont has issued No. 39 in its series, the Neoprene Notebook, containing data on laboratory results and industrial applications for neoprene products.

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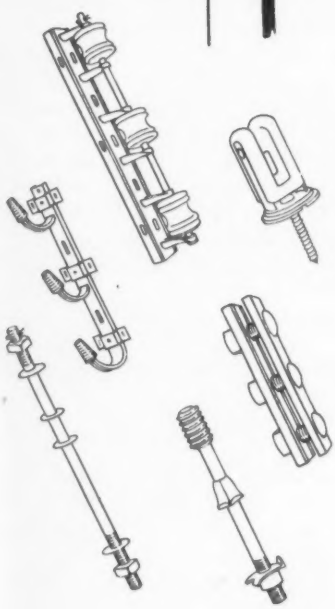

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ELECTRA'S HUSBAND

"DON'T forget to turn off the lights," I said to Electra as we left the dinner table one night recently preparatory to going into the living room.

"That's a strange crack coming from you," she commented. "Usually you say to leave them on—it makes the house more cheerful. Now you yap about turning them off. Could it be that you believe that power shortage talk that has been appearing in the papers?"

"Don't say power shortage," I answered with a touch of irritation in my voice. "It isn't a power shortage that is bothering this region. It's the drouth. What we need is rain and snow. We are faced with the greatest water shortage in our whole history."

"Water shortage or power shortage, I don't see any difference," Electra said.

"There is a considerable difference, dear lady," one of our guests said. "Unfortunately the public doesn't understand where the difference lies. They have been fed too much hokum about water power—how it is cheap, and how it belongs to all of the people. No one has told them that nature has something to say about it. Water power is all right if there is plenty of water. But every so often we get a dry cycle and then it's no water and no power."

"Bill's right," I said. "If any of your friends talk about a power shortage, disabuse their minds. Tell them to pray for rain."

"We in this region, and for that matter in the whole country, have been really short sighted in utilizing our water resources," our guest continued. "We look upon water as an inexhaustible resource like our land and our forests. Our land wears out from overcultivation, our forests are cut or burned and our water is misused. Water, essential for human existence, is really a limited resource, which should be utilized on a long-range basis and to the very best advantage if this nation is to receive the maximum benefit from its use. As a matter of fact, evidence shows that in cutting of timber, in over-use of our grazing lands, in the construction of reservoirs, in the dredging of navigation channels and in the construction of levees for flood control, we haven't always proceeded wisely. Many of the end results of past practices are posing water problems of great importance."

"I didn't know that," Electra mused. "Water has always been just water to me. Here at home it comes out of the faucet. Up at the ranch they pump it from the ground for irrigation."

"You forget or overlook some of the other aspects of water," our guest said. "How about the great floods which are steadily increasing in intensity and periodically sweeping down the rivers of the country? The irrigation pumping you speak of has steadily depleted the ground waters, thus imperiling the water supply of many farms and ranches and even some cities. The great 'Dust Bowl' has a water problem. Have you ever seen badly eroded lands where tillable soils have been washed away? The polluted streams of this country constitute a problem of major importance."

TELL THEM TO PRAY FOR RAIN

"Electra knows that," I cut in. "We've seen that wonderful General Electric movie."

"Then there are reservoirs that are filling to the top with silt," our guest went on, ignoring the interruption. "And finally there are large areas especially here in the Far West, that are still suffering from lack of water. If all these ill effects of the mistakes of the past are to be repaired and are to be avoided in the future, the people must reappraise the uses to which they want to put their water resources. They are going to have to adopt some simple rules of conservation based on the preferences for which water is to be used.

"This can be illustrated quickly with some figures which have been worked out by engineers. An acre-foot of water, and Electra knows what that is from living on a ranch, when delivered to a farmer will enhance the value of the crops grown by $27 on the average. That same amount of water if used for city homes and industries would have an average cost of $54. Now if you take this acre-foot of water and let it fall 150 feet through the turbines of a water power plant, the resulting electricity would be worth 50 cents, priced by the formula used by a government bureau."

"Of course you can use the water for two purposes in some instances," I commented.

"That's true and its a desirable thing to do," our guest said. "However it doesn't change the relative values. Nor does it alter the fact that water should be conserved and used wisely. The largest amount of agricultural wealth will be produced and the greatest number of beneficial results will be realized if rain is retained in the soil or stored near the area where it falls, for use within the area or for diversion to other areas for beneficial use. Nature at one time managed this very well, particularly in the humid areas. But man, with his profligate and destructive ways, has upset the original balance between soils, grasses, forests and natural lakes and swamps. Now he must worry about restoring that balance. This means the maintenance of a reasonable proportion of vegetative cover. It means the restoration or creation of head water marshes. Check dams must be built to slow down the flow in creeks. There must be more local retarding basins and reservoirs. Reforestation will have to be practiced instead of just talked about. Wise crop rotation and proper methods of plowing and cultivating are also necessary. The beneficial results of all of these conservation policies would be far reaching."

"But when it doesn't rain, it doesn't rain," Electra said. "The whole thing reminds me of the plight of the shipwrecked sailor on a life raft—'water, water everywhere, but not a drop to drink.'"

"Let me tell you about that," I said. "Turning ocean water into potable water is not so silly as you might think."

"Tell me some other time," Electra said. "Right now, let's get on with our bridge game."

Power Pinch is On!

Here's How *DFR Step Type Voltage Regulators Can Help You

YES, the squeeze is on — System capacity is increasing slowly, while loads are increasing fast. So that today, load and system capacity are within 5% of each other. Here then, is an idea that can, in effect, boost your system capacity: Eliminate ⅔ of the kilovars due to regulator excitation by using Allis-Chalmers DFR step type regulators. These modern regulators require only 8% excitation . . . compared with 25% for conventional regulators. And DFR regulators save you $10 per installed kva on capacitors needed to balance the high exciting current of old type regulators.

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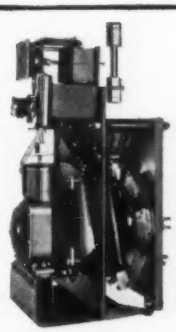
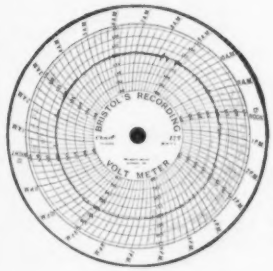
*The DFR regulator is the only station type step regulator you can buy for single phase duty. It is furnished in sizes up to 6,900 v, 250 kva. Narrow, ± 1 volt band widths are held by the DFR regulator due to automatic "Feather Touch" control and full voltage integration. For further information on cutting kilovar losses, call your nearby A-C office, or write ALLIS-CHALMERS, MILWAUKEE 1, WIS. A 2389

An oil-immersed, rugged, self centering, shock absorbing, quick-break mechanism is used.





Narrow band widths due to automatic "Feather Touch" control and full voltage integration.

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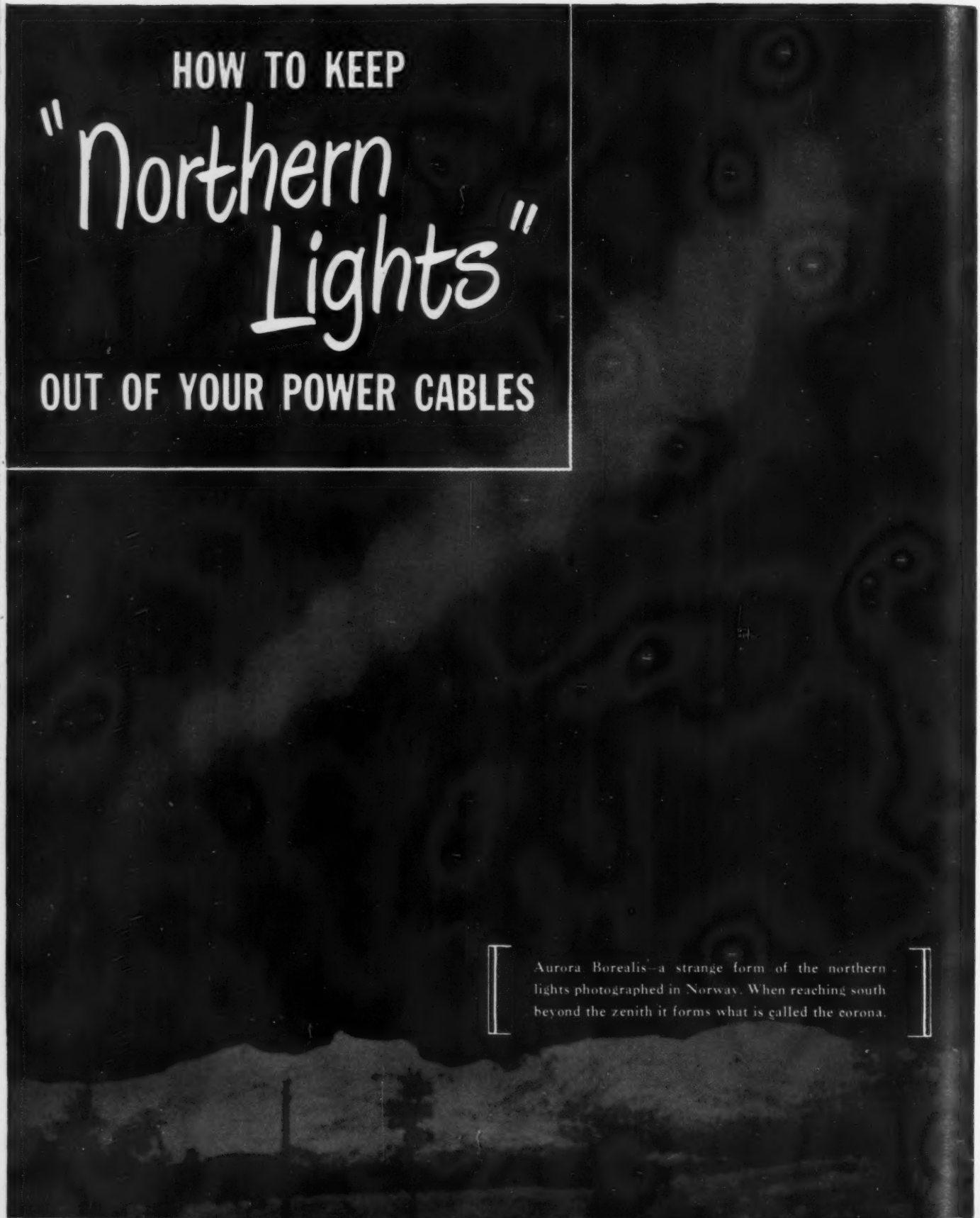
"Originators of the 5/8% Step Regulator!"

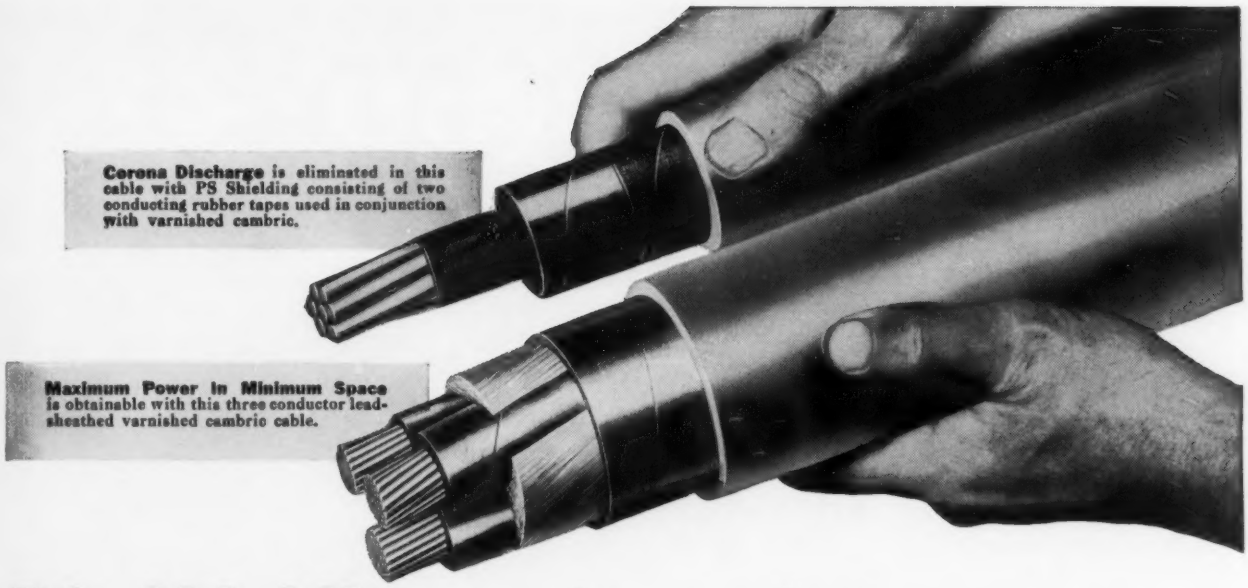
HOW TO KEEP "Northern Lights" OUT OF YOUR POWER CABLES



Aurora Borealis—a strange form of the northern lights photographed in Norway. When reaching south beyond the zenith it forms what is called the corona.

Types of Varnished Cambric Cables

- Single-conductor series street lighting cables.
- Multiple-conductor non-leaded and unarmored cables.
- Control cables with combination of different colored braids.
- Single-conductor lead-sheathed cables.
- Single-conductor non-leaded cables.
- Multiple-conductor lead-sheathed or metallic-armored cables.



Corona Discharge is eliminated in this cable with PS Shielding consisting of two conducting rubber tapes used in conjunction with varnished cambric.

Maximum Power in Minimum Space is obtainable with this three conductor lead-sheathed varnished cambric cable.

PS Shielding puts a stop to Corona discharge

CORONA discharge of power cables is small in comparison to that of the Aurora Borealis or northern lights but can be extremely troublesome. Any little air gap in a power cable is a potential source of damage from corona discharges. When a metal-shielded cable is bent and later straightened, or when it expands and contracts with alternate heating and cooling in service, the metal shield tends to separate slightly from the insulation forming air gaps. The voltage of the conductor causes a spark discharge across the gap with attendant corona and ozone formation.

With type PS Shielding, this condition does not occur. The flexible conducting tape is always in intimate contact with the insulation, thus preventing formation of air gaps and eliminating corona discharges.

In cables for operation at the higher voltages, "conductor shielding"—added to the shielding over the insulation—provides a further improvement in operating characteristics. This consists of a conducting tape applied directly over the copper conductor, as pictured above.

The improved U·S·S American Varnished Cambric Cables with PS Shielding offer maximum freedom from faults . . . for they not only eliminate corona troubles but also have higher resistance to heat. They can be operated at 85° C—notably higher than rubber . . . and in the lower range of working voltages (5,000 or less), they may be safely operated at the same maximum temperatures usually recommended for paper insulation.

Write for the latest information on U·S·S American Varnished Cambric Cables.

WHERE TO USE U·S·S AMERICAN VARNISHED CAMBRIC CABLES

IN MODERATE OR LOW-VOLTAGE INSTALLATIONS where its superior heat resistance permits greater current carrying capacity for a given copper area.

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IN POWER PLANTS for general wiring and such applications as insulated bus bars, motor and generator leads, connections for oil switches, transformers and voltage regulators.

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U·S·S American Varnished Cambric Cables

NOT WITH *Full Coverage FUSE PROTECTION

Sneak-outs are fuse operations which are plainly unnecessary, and not attributable to system disturbances of the moment. Commonly they are the result of pre-impairment of the fusible element by corona, corrosion, vibration, abrasion, **or high current surges**—destroying original time-current characteristics and nullifying coordination with other protective equipment.

But, Sneak-outs can be avoided . . . because full coverage protection . . . as afforded by the SM Power Fuse . . . includes a fusible element of permanent time-current characteristics. High current surges or short circuits which raise the temperature of this element to any point . . . even within the range of fusion . . . but short of severance . . . do not injure it. Corona is eliminated and corroding atmospheric conditions have no adverse effect upon it. Vibration does not embrittle it.

Original time-current characteristics are thus maintained throughout the useful life of the SM Fuse. In short circuit protection, no "damaging curve" is required when making calculations for close coordination with other protective equipment. **No unblown "suspect" fuses need be replaced after high current surges.**

The "non-damageable" nature of the fusible element of the SM Power Fuse is the result of exclusive S & C design, employing pure silver, helical-coil construction which resists electrical and chemical deteriorating influences, and permits sudden thermal expansion without damaging stresses.

Full information on SM Power Fuses may be obtained by writing . . . now . . . for Bulletin 200E.

*A term adopted to call attention to the importance of considering **all** conditions under which a fuse may be called upon, or have the ability, to operate dependably.

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MARCH, 1948 Vol. 100, No. 3

ELECTRICAL WEST

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED SECTION OF THE U. S.

Weather, Water and Power

Irving P. Krick

Professor of Meteorology
California Institute of Technology

AN adequate water supply for the generation of power and for the many agricultural and industrial uses for which water is required in the Western states, is dependent at the present time upon the vagaries of the weather. The continual increase in population of the area, the resultant drain placed upon existing facilities for hydroelectric power generation and water storage, as well as the current deficiencies in annual precipitation, have brought the importance of water supply into sharp focus in recent months.

Excluding for the moment the possibility of stimulating clouds to produce rain or snow, future estimates on water supply are based primarily upon current snow surveys. Numerous attempts have been made to predict water supply on the basis of climatic variations or alleged weather cycles evolved from studies of tree rings, ocean temperatures, sun spots, clay varves or other factors having an indirect relation to weather. The scarcity of actual weather records and particularly those in suitable form for proper study and evaluation in determining the causes of rainfall has necessitated this rather nebulous treatment of the relation of weather to water supply. For this reason commitments based upon predictions developed from such studies have been considered hazardous.

There seems to be little doubt, however, as to the reality of climatic changes in the past and their profound effects upon civilization. It is not difficult to establish the fact that such variations have occurred—it is the validity of predictions based upon them that is dubious.

A brief resume of climatic variations during historical times may be of interest. These variations have been sufficiently great to dominate the rise and fall of civilization during the last six thousand years and have been even more dramatic during the various geological eras, where evidence points to alternate periods of great warmth and extreme cold—the latter characterized during the late geological epochs by extensive glaciation on both hemispheres. Various types of evidence appear as indications of long period climatic swings. For example: archaeological ruins of cities have been discovered in areas where water is not now present and in areas now completely under water. Remnants of slowly decaying forests in Chinese Turkestan which is now a desert have been unearthed. Roman irrigation works have been discovered in North Africa and Syria, where there is not now enough water to fill them. Records of crops and traces of vegetation in certain regions now climatically unsuited for these plants are common.

This U. S. Soil Conservation photo shows men measuring depth of snow

In general there seems to have been a period from 5,000 to 1,500 B.C., when hardwood forests covered Europe, while Western Asia was dry and warm. From 1,500 B.C. to 400 A.D., storminess increased and temperatures decreased in Western Europe. The forests died out, peat bogs formed and there was a southward advance of the polar ice sheet. From about 400 A.D. to 1,000 A.D. dryer, warm conditions again prevailed The Viking civilization spread to Iceland and Greenland. After 1,000 A.D. storminess increased, winters were cold with all the rivers frozen and the Viking colonies died out. Climatic conditions were better to the south where rainfall increased and the Italian Rennaissance developed.

It is the contention of many investigators, especially geologists, that during glacial periods storm tracks are shifting southward bringing rain to normally desert regions. The same explanation can be applied to the shorter period climatic swings. As the desert regions are shifted south, they displace the jungles which they invade. As an example of this action upon the rise and fall of civilization, it may be inferred that the Mayan civilization must have developed in the period around 1,000 A.D., when relatively dry conditions rather than the present jungle conditions prevailed in Yucatan. This occurred simultaneously with abnormally heavy rains in California as indicated by the tree rings, thus during this era all of the climatic

Chart I—The normal west to east storm movement over the North Pacific shown in this chart brings rain to the northwest area of the United States and the west coast of Canada. Seldom does the rain area extend below San Francisco and very often only reaches southern Oregon. Storms move eastward across northern United States and allow only brief fair weather periods between one storm and the next. Temperatures are near normal everywhere and the southern states are dry

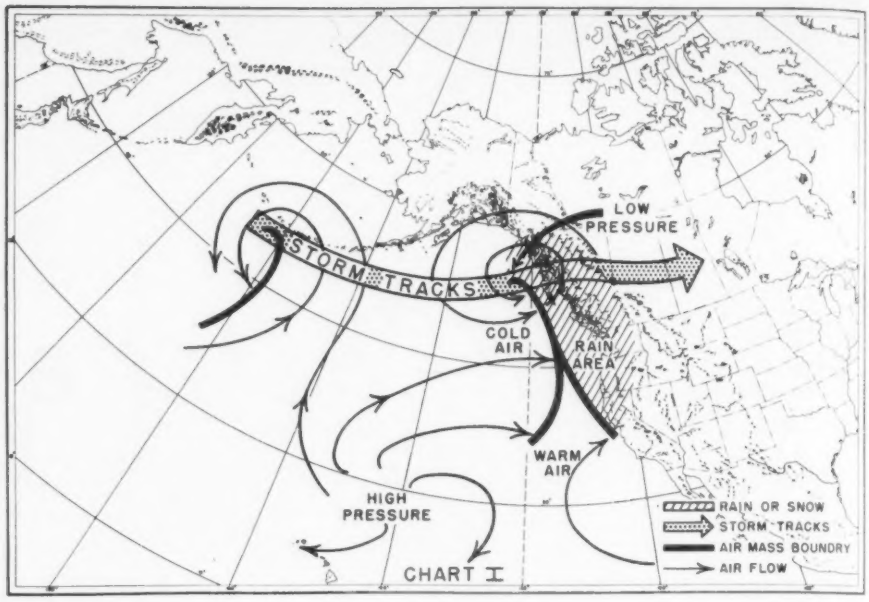
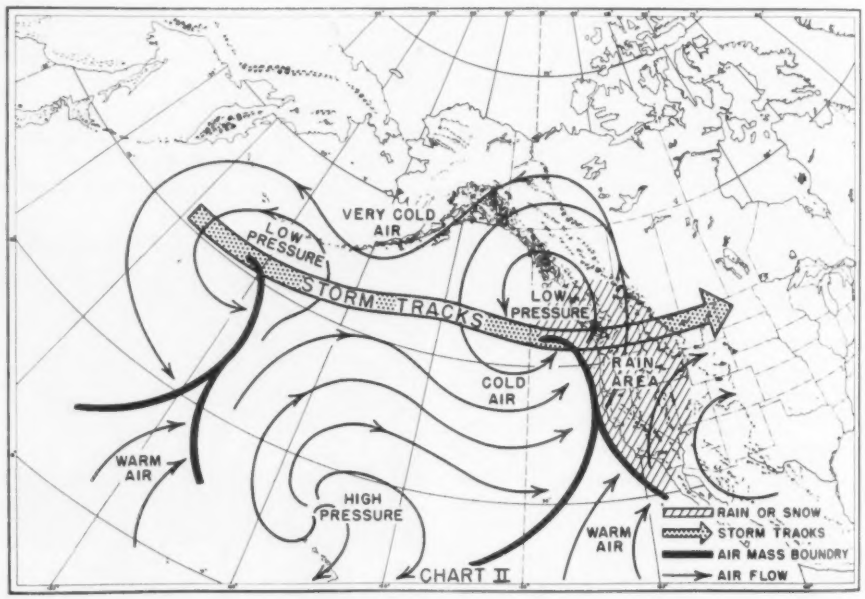


Chart II—Prolonged periods of precipitation occur with this weather situation. Accumulations of rain or snow are heavy over most of the Western states and temperatures are above normal due to the strong flow of warm air masses from low latitudes



zones were shifted southward in relation to their present-day positions.

From these historical data it becomes apparent that the climatic variations in relatively modern times have been sufficiently great to alter the very course of history. Early investigators, realizing the importance of climate upon human activities, began to study available weather records in an effort to predict swings which would occur within the span of a lifetime. Bruchner in 1890 gave a thorough treatment to such short-period climatic variations based upon long records of rainfall and temperatures, the grape harvest, height of lakes, river floods and related phenomena. He found a certain rhythm in these variations which he chose to call a cycle. The length of his "cycle" varied from 20 to 50 years, averaging about 34.8 years.

Bruchner's work led to many other studies aimed at discovering a cyclical trend in weather which could be used as a basis for prediction. Many of these investigations have been predicted upon the sun spot period of 11 years. The sun is the source of energy which drives the atmospheric circulation. Therefore variations in the output of solar energy must be reflected in some way within the atmosphere. However, so many periodicities have been found which can apparently be related to sun spots, all of them with such small amplitudes that their usefulness as a means of prediction is doubtful. Furthermore, their relationship to weather has never been accurately defined. To date one of the few apparent links between solar activity and weather has been established by Clayton. He has shown that in years of great solar activity, atmospheric pressure is unusually high in the middle latitudes and low in the equatorial zone. This, of course, will have a bearing upon the storm tracks of middle latitudes. (See Charts I through IV.)

Sir Gilbert Walker and other investigators have demonstrated that seasonal weather characteristics in various regions of the earth are interrelated. Such investigations have proved fruitful in predicting seasonal weather trends in some parts of the world.

Many investigations have been made correlating the southward extent of drifting ice from the Greenland Sea in the spring and early summer with subsequent weather in Europe. There seems to be some indication that during years of excessive ice the water surface is cooled below normal and remains so for many months after the ice has melted. It is believed that this causes higher than normal atmospheric pressure over the North Atlantic, forcing storms to follow a more southerly track into Europe thus producing above normal rainfall in Scotland and Norway the following autumn. Studies of this type for the Pacific region started by McEwen in 1916, resulted in forecasts of seasonal precipitation for southern California. Here again it is believed that cold summer water temperatures off the Pacific Coast are followed by wet winters.

Storm Patterns

In recent years the Department of Meteorology at the California Institute of Technology has attacked the problem of forecasting long-period weather fluctuations through studies of the circulation patterns in the atmosphere responsible for the weather. Only since the war has a sufficiently long record of the atmospheric circulation over the Northern Hemisphere been available for such studies. Unfortunately this

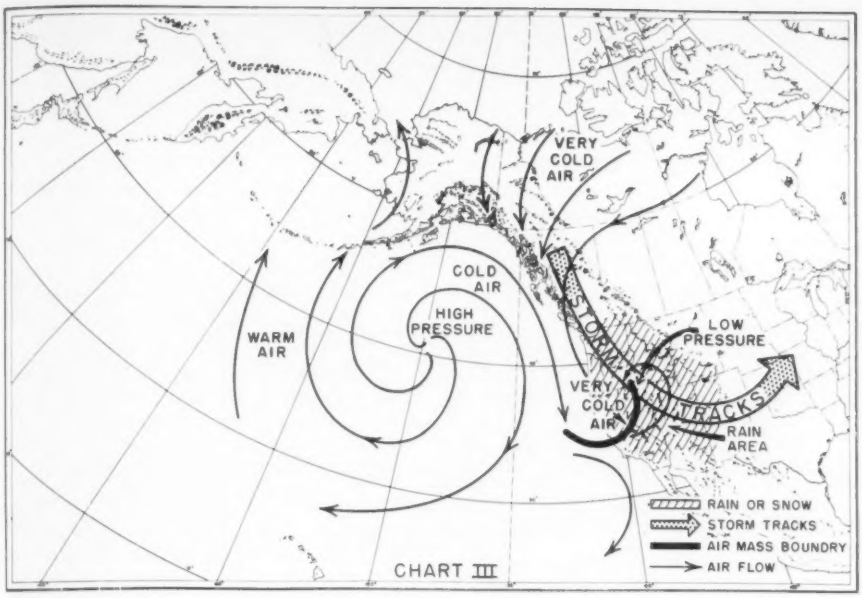


Chart III—A strong flow of very cold air from the far north characterizes the weather of this pattern. Local violent rain storms are frequent along the West Coast, while moderate to locally heavy snow storms are common over the mountain and foothill areas. Snowfall is often exceptionally heavy in the Cascades and on the eastern slopes of the Sierras in northern California. Record low temperatures occur when the skies clear again after these storms

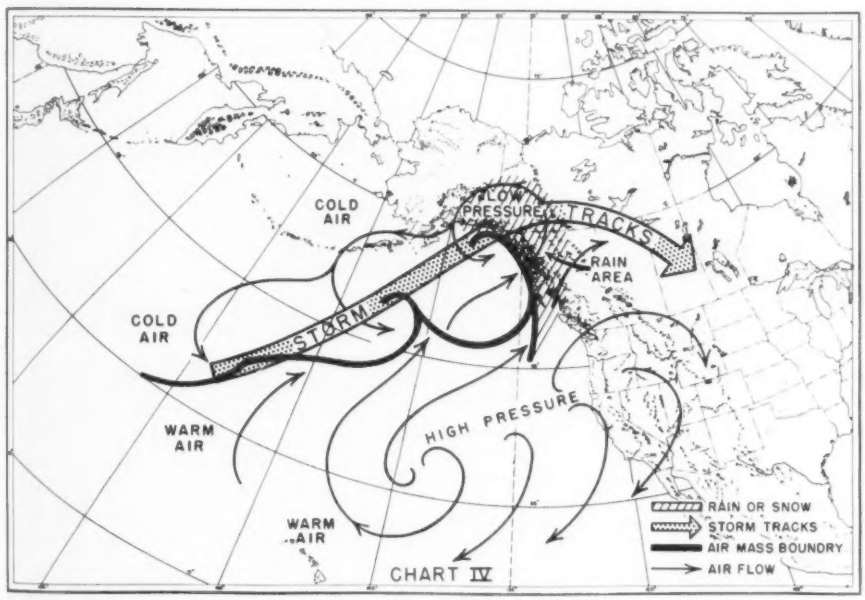


Chart IV—This is the weather type which produces the mild climate for which most of California is famous. Storm tracks are displaced well to the north bringing heavy rains to British Columbia and in some cases rain also occurs in Washington and Oregon. However, skies are generally clear throughout most other areas of the Western states. Nights are chilly in the interior valleys, but the days are warmer than normal, particularly in the south

record, which covers a period of fifty years, is too short to discern any of the climatic variations referred to above. However, the detailed study of this weather archive has revealed that the atmospheric circulation patterns are essentially stable, exhibiting a limited number of configurations which recur constantly. This weather record has been classified day by day in terms of the basic circulation patterns which have been discovered.

By preparing a catalogue of the various atmospheric processes from this record it becomes possible to correlate current weather trends with those of the past fifty years, using analogous past situations as a basis for prediction.

Some success has been attained through the use of this method in predicting monthly and seasonal weather trends and it shows promise of yielding reliable forecasts over even longer periods.

There are four basic weather patterns which control water supply in the Western United States. They are shown in Charts I through IV. An important feature of these configurations, and one closely related to the precipitation produced by the storms passing eastward through the Western States, is the inter-action occurring between air streams of cold polar origin and the warmer tropical or sub-tropical currents to the south. Because of their relatively high temperatures, the tropical air streams contain large amounts of water vapor. This moisture results from evaporation over the warm Japanese current. As this warm air comes in contact with the cold polar air masses, wave-like disturbances arise along the boundary of separation between them, forcing the warm moist air aloft. This is a rainmaking process because the ascending motion induced in the warm air as it is forced up over the polar current causes it to expand and cool because of the lower air pressures aloft. This action precipitates the water it contains.

The positioning of the boundary between cold polar air and warm tropical air, the path and rate of movement of storm centers along this zone have an important bearing upon the water deposited over a given area. These features of the atmospheric processes controlling water supply in the Western United States are shown in Charts I through IV.

Chart I illustrates a frequent pattern during the rainy season. Storm areas shown developing between cold air to the north and warmer air currents to the south move rapidly from west to east producing substantial rain over British Columbia and southward along the Pacific slope to central California. During the winter season these storms contribute primarily to the rainfall of the Pacific Northwest as they pass eastward from the Pacific Ocean to the Rocky Mountain area.

Chart II shows a circulation pattern similar to that in Chart I but displaced southward. It occurs less frequently but produces heavy rain and snow in northern California, Washington and Oregon. Its influence extends southward to the Mexican border. A high frequency of this pattern during the winter months causes wet years on the Pacific Coast. The excess is usually reflected in the rainfall of the states immediately to the east as well.

Chart III exhibits a circulation pattern differing considerably from the more normal weather processes. The

storms on the Pacific Coast in this situation move rapidly southward before assuming eastward movement. This causes very cold polar air to invade all of the Western states following each such storm. These cold waves with temperatures below freezing usually result in severe damage to produce and citrus. Precipitation in winter produced by this circulation pattern is in the form of snow down to relatively low elevations.

Chart IV demonstrates a pattern where the storms are displaced far north of the usual winter position. In these situations rain is heaviest in British Columbia, leaving the Pacific states relatively dry. If the pattern shifts still farther north, intense storms tend to develop off lower California and become active over southern California coastal areas, Arizona and New Mexico but are not felt in other Pacific states. This pattern developed during the fall and early winter of the 1946-47 season and produced unusually heavy rains in southern California while the remainder of the state was experiencing a virtual drought.

Types I and IV, the relatively dry weather processes of the South Pacific states, account for about 70% of the weather and therefore the lower annual rainfall of these areas as compared to the Pacific Northwest. Experience shows that an excess of Type II will produce a wet year in all Pacific Coast states; an excess of Type IV a dry year; an excess of Type III a cold year. It has been possible to describe all Pacific Coast weather of record in terms of the four basic patterns illustrated here or combinations thereof. A quantitative method has been devised to evaluate the influence of each weather process as it affects a given watershed. Thus the total seasonal rainfall, which is a function of the frequency with which each process occurs over the area, can be expressed in numerical form. To cite a specific example—let us relate the rainfall of San Francisco during the months of December, January and February, which is the rainy season, to the weather pattern shown in Chart II, since its occurrence produces maximum rainfall in that area. Table I gives total rainfall in inches at San Francisco during these months for four dry seasons and four wet seasons. For each year the number of units of Type II accumulating during the period is indicated. In each case this number is a measure of the frequency and intensity of the process at San Francisco. The four dry years exhibit a total of 90 units, whereas the wet years show a total of 218 units. The normal total for any four years would be 126 units. There is not a linear relationship between the amounts of rain in the wet and dry cases and the respective number of units of Type II weather. This is due to the influence of the other weather processes occurring during the period. However, the relationship is sufficiently striking to illustrate the point.

Table I

San Francisco, Calif.

Dec. Jan. Feb.

Average Rainfall—12.85 Inches
Average Type II Units—31.5
Total Type II Units for 4 Average Years—126

Dry Years	Rainfall (inches)	Type II Units	Wet Years	Rainfall	Type II Units
1911-12	5.42	40	1908-09	20.19	64
1912-13	5.57	20	1913-14	20.21	42
1919-20	4.70	22	1915-16	24.78	68
1938-39	6.49	8	1940-41	21.20	44
Total	22.18	90	-	86.38	218

It becomes apparent that, if one can match the current season with one in the past exhibiting similar characteristics or can project forward the frequency with which the various weather processes will occur, a determination of the total seasonal precipitation can be made. An example of the use of this method is given by a forecast for California which was prepared early in November 1947, covering the 1947-48 winter season.* The most frequent weather process up through January and early February was Type IV with occasional periods of Type III. This has resulted in relatively dry conditions with unusually cold weather occurring following the few storms which swept rapidly southward along the Pacific Coast. Typical of this development was the storm occurring the first week in February.

During the remainder of the winter season, it is anticipated that the storm periods will be more frequent with Class IV giving way to fairly frequent occurrences of Type I and occasionally Type II but with characteristics of Type III persisting. This should yield rainfall near or above the normal during March and April on most of the Pacific Coast. However, rainfall during these months will not offset the large deficiencies which occurred during the first part of the season.

At the present stage in the development of this method it would be premature to attempt a prediction for next year or the year after. It is possible that continued effort and the extension of researches now under way, ultimately will yield reliable forecasts for more than a few months.

Meanwhile one of the most useful indices for forecasting available water for the power streams of the West is from the snow surveys which are prepared in detail for many sectors. It is possible that in future years this information, coupled with accurate long-range predictions of precipitation, will provide a means of accurately estimating water supplies so that allotments for various activities can be established with precision over periods of several years.

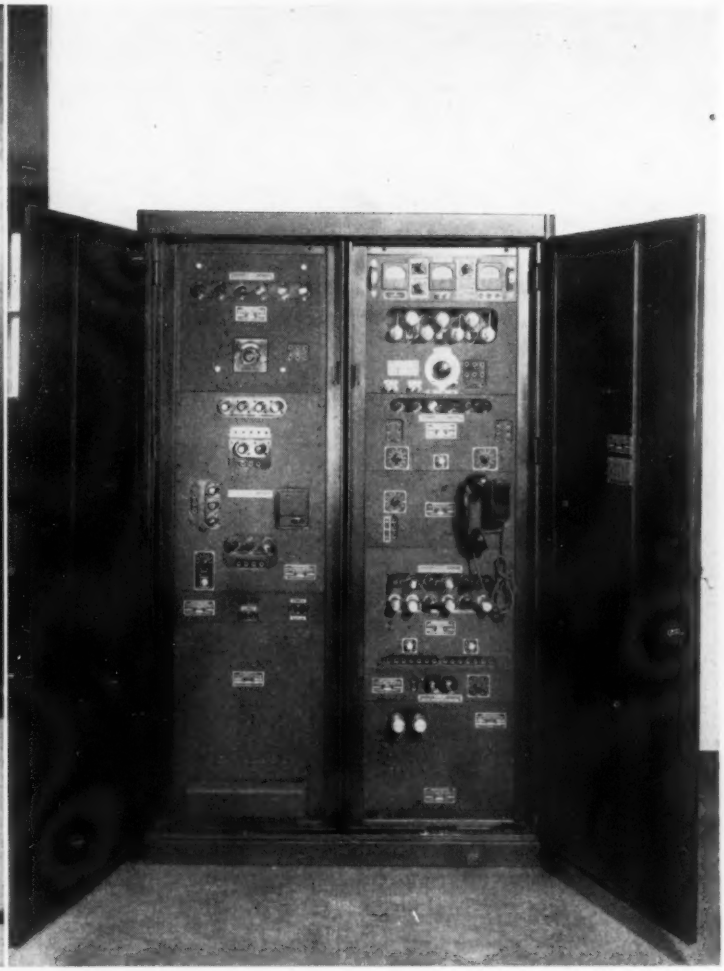
Induced Rainfall

We cannot overlook the possibility of increasing water by artificial means. Considerable experimentation is under way in different parts of the world to determine the economic feasibility of artificial stimulation of clouds to produce rain. It appears that during periods of drought such activities would be a complete failure, owing to the prevalence of unfavorable atmospheric stratifications but, when rains come or are imminent, it may be possible to intensify and localize the fall to augment water supplies. An increase in snowcover over watersheds normally blanketed with snow during the winter months is a goal which may be achieved by experiments now in progress. Considerable value could be derived from such practices.

However, as shown in the early paragraphs of this discussion, there comes a time when the forces of nature so alter the course of moisture-laden air streams that fertile areas become desert wastes and jungles encroach upon arid lands. During these intervals the efforts of man to cause rain may become puny and ineffectual. Let us hope that science can meet this challenge and prevent a recurrence of the great migrations of the past which have been occasioned by man's inability to control the elements.

* Irving P. Krick, "Shall We Have Snow?" "California," December, 1947.

Operator using first single sideband suppressed carrier equipment installed on the Pacific Coast. Installation provides a 262-mile channel on Pacific Power and Light Co.'s line from Portland, Ore., to Pasco, Wash. Major advantage claimed for the system is that its suppressed carrier utilizes a frequency band less than half the width formerly required by standard AM double sideband or FM carrier



Rack-mounted panel units after assembly in the equipment cabinet. Left panel mounts carrier receiver; single sideband panel with modulator, demodulator, oscillator and mixer; power distribution unit and 125-volt rectifier. Right panel mounts removable test meter unit, amplifiers, electronic transfer unit and a 640-volt rectifier. Both panels swing open for easy accessibility of interior parts

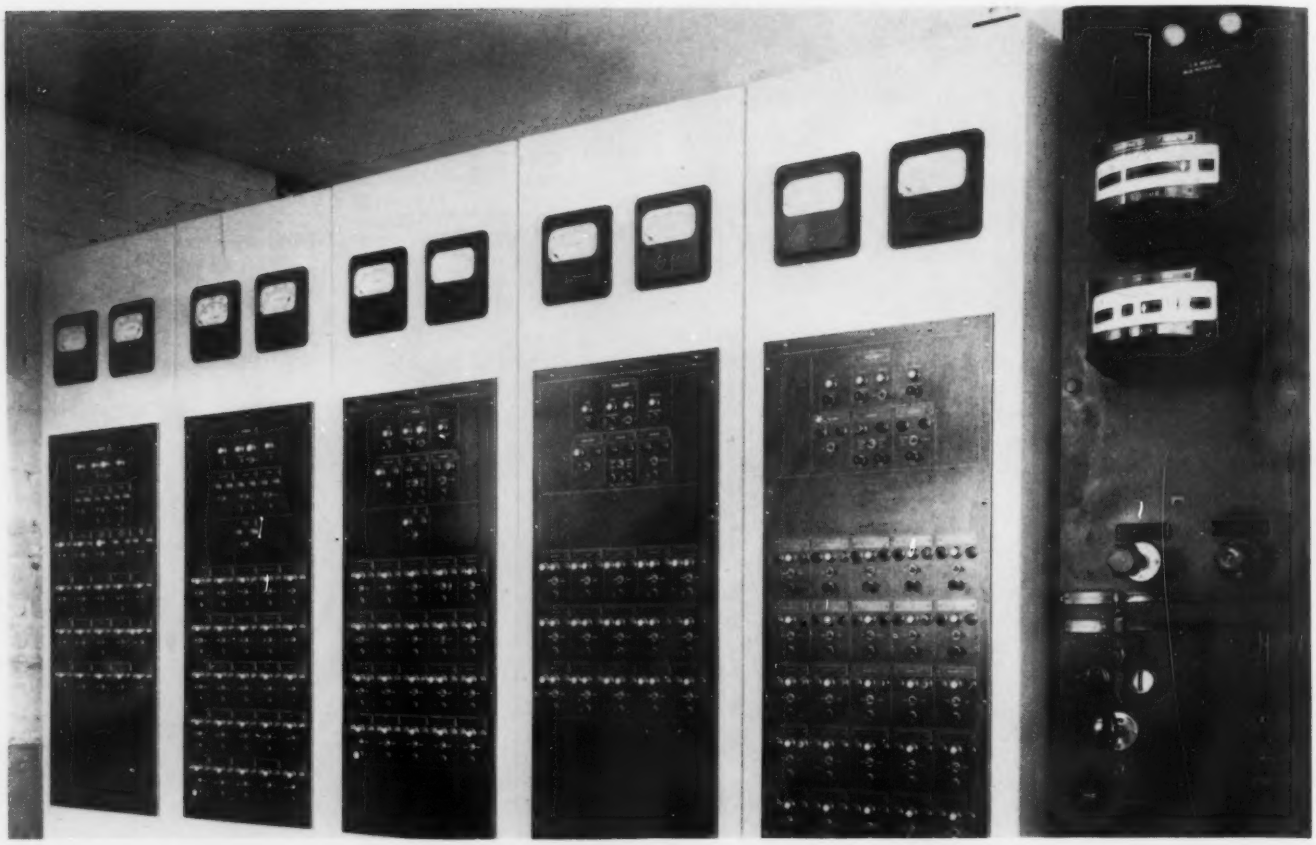
FIRST SINGLE SIDEBAND CARRIER

NEWEST thing on the West Coast in way of power company carrier-current communication is a single sideband suppressed carrier installation recently made on lines of the Pacific Power and Light Co. Equipment provides a new 262-mile channel between Portland, Ore., and Pasco, Wash., where it is coupled in cascade with another channel from Pasco to Spokane. An all-carrier channel is thereby established from Portland to Spokane which will aid greatly in dispatching on the Northwest Power Pool.

The new Westinghouse system installed is unique in that it eliminates the undesired sideband without dependence on filters. Copper-oxide ring modulators provided with a method of balancing are used in place of vacuum tubes to suppress the carrier. Two sets of modulator circuits are supplied with carrier signals displaced 90° and also audio frequency signals displaced 90°. Satisfactory cancellation of the undesired sideband group is effected by design of the phase shifters and proper combination of the four resulting signals in the two modulators.

All transmitters and receivers on the channel are tuned to the single 91.4-kc. frequency. Entirely automatic operation is controlled by an electronic transfer unit at each station, which the operators have found will even allow them to interrupt each other.

Major advantage claimed for the single sideband equipment over conventional AM double sideband or FM carrier is its use of a waveband less than half the width formerly required. This would materially increase the number of channels which can be accommodated in a frequency band.



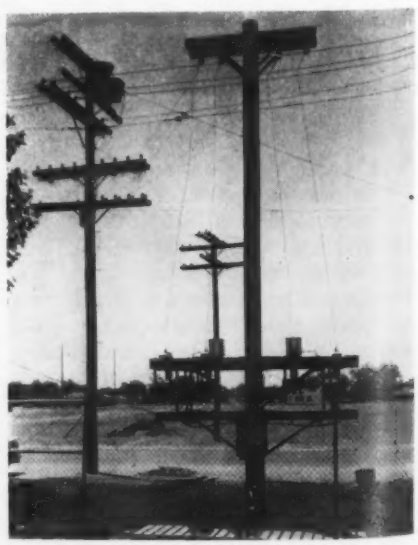
Master supervisory control switchboard of Southern Calif. Edison Co. Typical installation at Tulare combines operation, indication and telemetering for six controlled substations at distances up to 32 miles, alarms for seven others

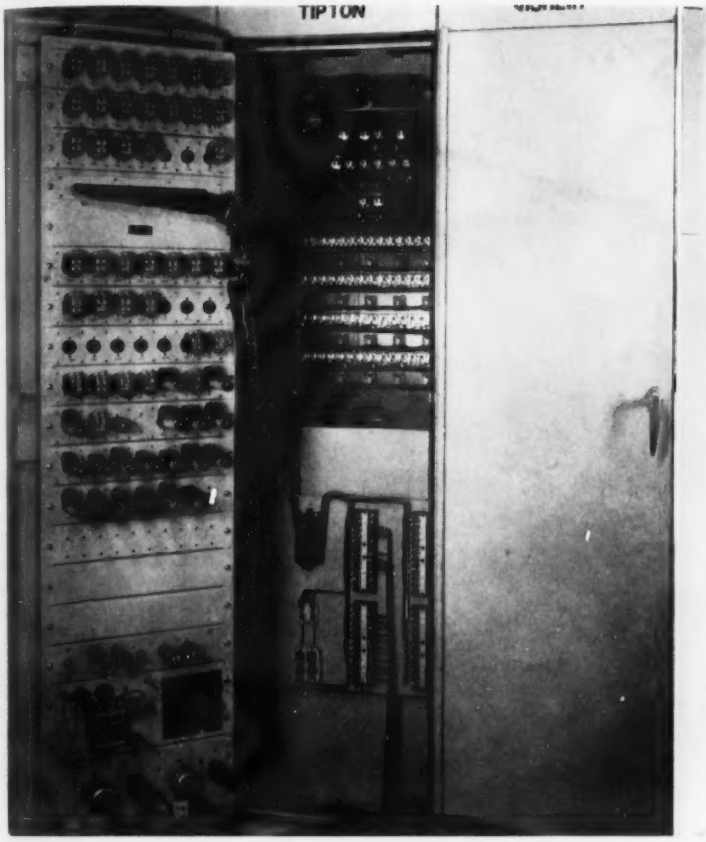
Supervisory Decentralizes Control

USE of supervisory control on large utility systems of the West advanced a major step with completion and successful operation of Southern California Edison's first installation in the San Joaquin Valley. Two dispatching stations controlling ten important substations are the vanguard of Edison's million dollar system-wide supervisory control program. It will ultimately include some fourteen major dispatching stations which will control approximately 50 important substations and provide remote alarm indication for about 100 smaller substations.

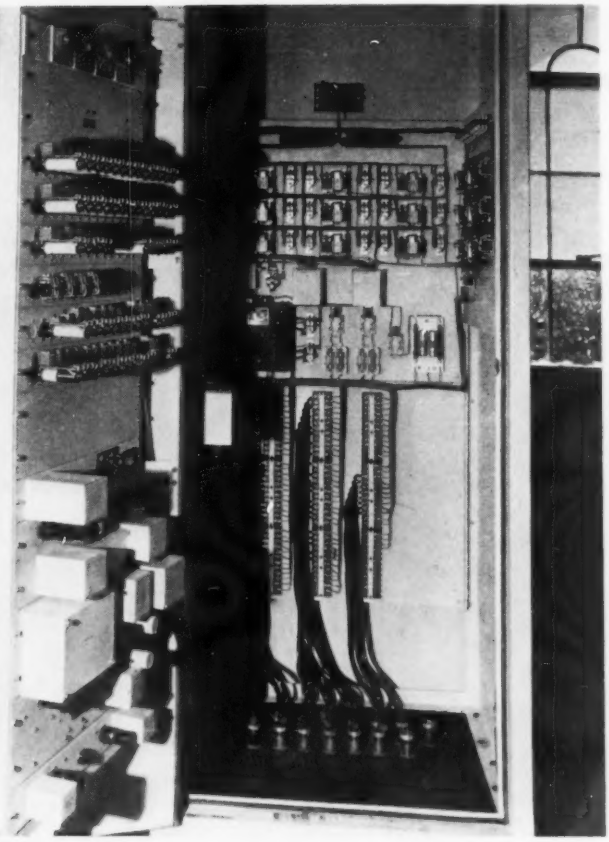
Type of equipment used on the system was determined by the channel adopted. Engineering study and past experience indicated open wire offered the best combination of reliability and economy. A single pair of No. 8 copper wires strung on 4-kv. insulators on existing poles was used. High insulation value of combination of air and porcelain reduces the problem of low shunt resistance due to leakage. Moreover, equipment as installed can operate with practically a short-circuit shunt resistance reading on the line, giving added dependability. For operation on such a channel at distances up to 32 miles, a Control Corporation system using audio-frequency signals operating tuned receiving relays was used. Up to five fixed frequencies between 200 and 500 cycles are used for operation. By pressing the proper button at the control station, the operator sends out a preset sequence of these frequencies. The tuned receiving relays respond and set up the required circuit at the controlled station—as an example, to energize a breaker trip coil. Red and green indicating lights on the operating panel are supplemented by a white light showing when the operating signal becomes effective. This

Terminal of open wire channel uses insulating transformers, reclosing fuses, lightning and surge gaps for protection





Rear of main board. Panel on door mounts tuned frequency telephone-type plug-in relays; wiring is easily accessible



Panel at controlled station. Telemetering transmitter in back sends volts or amps from indicating instrument element

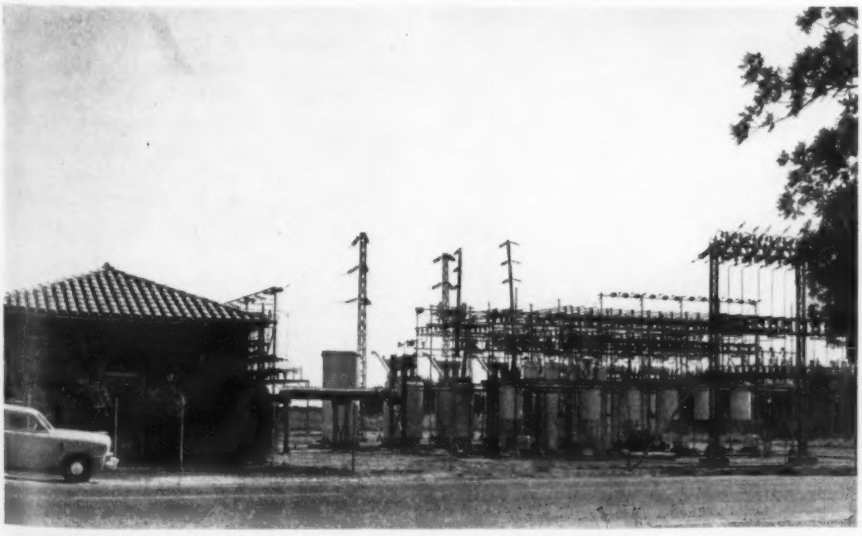
white light also indicates any change in breaker position originating at the controlled station. These indicating signals, as well as telemetering, are transmitted by frequencies between 3,000 and 10,000 cycles.

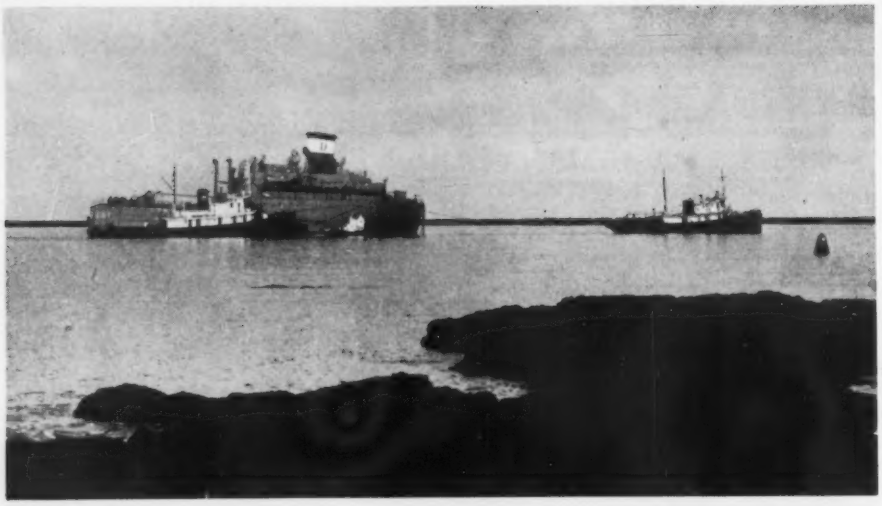
Either volts or amperes of a circuit at the controlled station can be telemetered. Operator selects the desired reading by pushing the proper button which sends the preset signal to connect the proper current or potential transformer to the input of the telemeter transmitter. Position of the pointer of an indicating instrument element is scanned by a rotating photoelectric system. Magnitude of the reading is measured by length of time it takes the rotating scanner to travel from the zero point until the pointer interrupts the light beam. Since the signal is identified by its assigned frequency and measured only by length of time, accuracy is independent of condition of the line and unaffected by low shunt resistance. The line is monitored by continuous transmission of voltmeter readings whenever other readings are not being taken. Since power is supplied by station batteries, the system is independent of power failures, and offers maximum reliability during emergencies, when it is most needed.

An additional use of the system is for both general and specific alarm indication. In addition to alarms from the controlled stations, alarm circuits from small distribution stations in the general area are brought in to the equipment and transmitted to the control station. This has allowed removal from the communication systems of over 100 insulating transformers previously used for remote alarms.

Completion of the program for installation of this supervisory equipment, now well along, will effect decentralization of control of the entire Edison system.

Typical controlled station with capacity of 6,000 kva., stepping down from 66 to 11 kv. Breakers can be operated, bus volts and transformer bank amps telemetered by dispatcher. Alarm circuits from smaller stations also come here





Tanker Unit Boosts Hilo Capacity

Top—Salvaged stern end of 10,500-ton tanker Fort Dearborn being towed into Hilo, Hawaii, after reconditioning in Honolulu. Forward two-thirds of ship sank north of Honolulu early in '47

Center—Permanent anchorage of stern in specially dredged basin. Reconditioned power plant drives 5,000-kva., 2,300-volt turbogenerator supplying the Hilo Electric Light Co. system

Bottom—Shore lines carry power over wooden saddles on these steel towers to a substation 1,200 ft. distant. Plant will supplement hydro during dry season, and allow for steam maintenance

SALVAGED stern end of the 10,500-ton tanker Fort Dearborn now serves the Hilo Electric Light Co. as a 5,000-kw. stationary floating powerhouse to supplement hydro plants during low water season and allow shutdown of their 3,500-kw. steam plant for essential maintenance. After being towed to Honolulu from the spot where the forward two-thirds of the 525-ft. ship broke off and sank during heavy weather north of Honolulu in early 1947, the stern lay idle for some months before being purchased by the Hilo company. Hawaiian Electric Co. was given the job of reconditioning the plant and planning its addition to the Hilo system.

Since the 5,000-kva., 2,300-volt plant complete with boilers, turbine-generator, condensers and all auxiliaries was contained in the undamaged stern, the chief problem was to put it in running order and make minor changes to facilitate delivery of the power to a substation and the company's 2,300-volt and 13,200-volt distribution system. Only work required on the hull was to trim and strengthen the area of rupture and isolate the circuits which had served the forward part of the ship. Flooding of the lower engine room resulted in severe corrosive damage to auxiliary motors and control. These, as well as all other necessary equipment, were returned to first-class condition without undue difficulty. Modification of the power circuit was accomplished by disconnecting the propulsion motor from its controller and reconnecting the heavy conductors to carry power from the generator to a new oil circuit breaker. A switchboard was installed to handle the oil circuit breaker, synchronizing and outgoing metering circuits. Shore power cables were taken through a ventilating funnel to the top deck, whence they pass to shore over wooden saddles on steel towers, with enough length to allow for any predictable movement.

Six weeks after reconditioning began, the hull was towed stern first 200 miles from Honolulu to Hilo. Anchored in a newly dredged basin by seven 5-ton concrete anchors, it was only necessary to make connections to flexible shore lines furnishing water and fuel oil and the outgoing electrical circuits before placing the unit on the line Dec. 31, 1947.

The Fort Dearborn is definitely a temporary installation to be disposed of as soon as a 5,000-kw. steam turbine unit is built and installed in the company's main steam plant. Operating experience and over-all plant efficiency will determine whether its equipment will be installed in a permanent location or the entire hull sold at auction.

PIPE TO CARRY 110-KV. CABLE

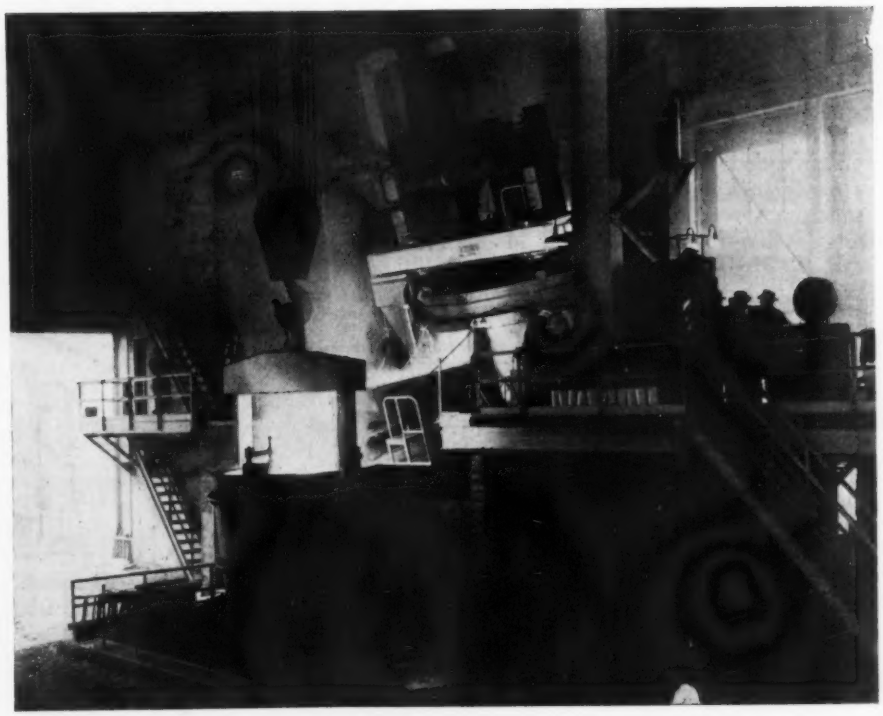
First gas-enclosed high-voltage cable on the Pacific Coast will be carried in this six-inch somastic-covered pipe line now under construction in San Francisco by the Pacific Gas and Electric Co. Present program calls for expenditure of $3,800,000 on four 110-kv. transmission circuits totaling eighteen miles. Two circuits will connect generating station P, now being enlarged to a total of 268,000 kva, and substation H, main terminus of power lines coming into San Francisco. One circuit from each station will feed 110 kv. for the first time into downtown San Francisco, terminating at a new $4,800,000 substation now under construction.

Pipe of quarter-inch seamless steel is covered with a somastic coating of asphalt, asbestos, sand and mineral filler at the factory. Forty-foot lengths in which it is shipped are welded together in the field, joined in 1,500-ft. intervals after high-voltage paper-wrapped cable is placed and spliced. Pipe is filled with inert nitrogen under 200-lb. per sq. in., the high pressure serving to fill voids and keep the insulation compact. Joints are covered with somastic material and the whole installation tested for gaps in the coating by applying 40-kv. from pipe to ground. Projected life of the installation, which is said to be completely protected from deleterious external physical or chemical action, is indefinite, but expected to be materially longer than any now in service.

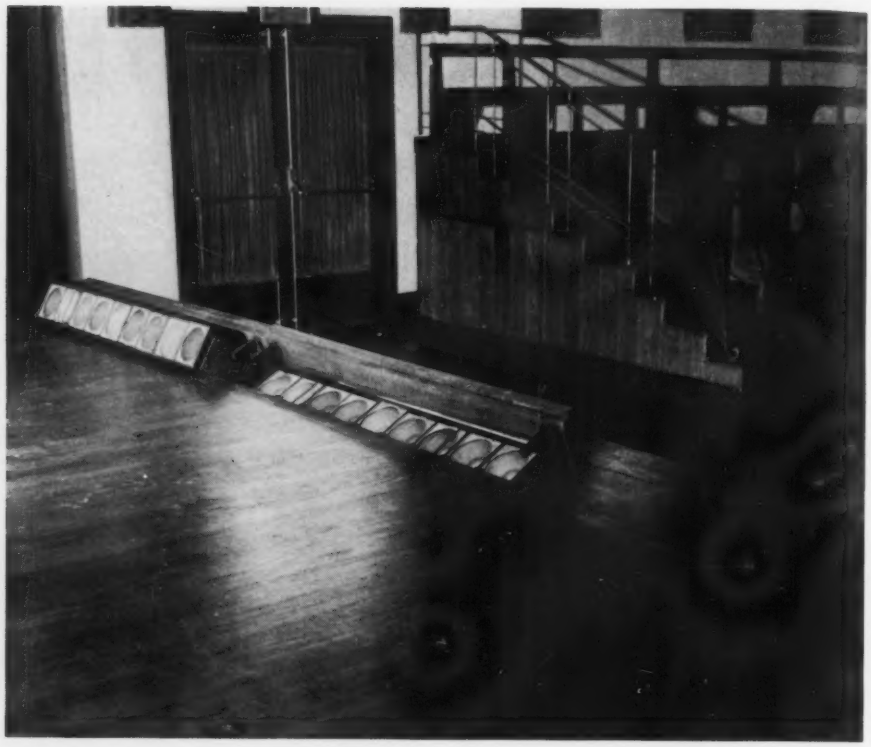
West's Largest Electric Steel-Making Furnace

Largest electric steel-making furnace on the West Coast handles a charge of 50 tons, doubling capacity of Bethlehem Pacific's Los Angeles plant. Transformer capacity of 15,000 kva. supplies the three 20-in., 3,600-lb. electrodes as they reach temperatures up to 6,000° F. First charge in the new furnace was heated to 3,000° F. in approximately four hours, one-half the time required by an open-hearth furnace of like capacity. Consumption of electric energy is expected to be about 5,000,000 kwh. per month—enough to supply a city of 26,000. Objectionable voltage dips in the plant and surrounding area have been minimized by G-E Amplidyne control of the electrodes.

Completion of this installation, part of Bethlehem's $14,000,000 Western expansion program, brings total steel producing capacity for its West Coast plants at Seattle, South San Francisco and Los Angeles to 658,000 tons of steel ingots annually to help meet the growing Western demand.



Flexible Lighting For a Small Stage



Footlight sections are the same as borderlights and can be used interchangeably. Disappearing footlight troughs also permit two open positions or closed

NEW population requires more schools. With a large program of school building under way, many new school auditoriums will be built. Each will have a small stage. Its ambitious dramatic students will want ample lighting facilities to create the moods and illuminate the scenes that will be used in their plays and programs.

Since school budgets generally are inadequate, how can a flexible lighting system be furnished? What units or facilities should be furnished initially? What plans can be made to add to such equipment later in logical sequence?

Answers to these questions were well provided in a recent installation by Associated Lighting Service of San Francisco for the Academy and Convent of the Sacred Heart in Menlo Park, Calif. The system gives great flexibility of control, allows an easier method of adjusting and focusing existing equipment, and simplifies the mounting and hanging of additional equipment as it is purchased.

The provision of a flexible modern stage lighting system that fits into a school budget is divided into four groups, Thus the school or theater without enough funds to do the complete job at one time can set up a complete stage lighting installation plan and then install the first two groups, knowing that every dollar spent will be a step directed towards eventual acquirement of the complete plan.

These four groups consist of the following:

Permanent facilities — 1. Wall and floor pockets. 2. Light batten and raceway assemblies. 3. Disappearing footlight sections.

Control board—This can range from the minimum of a circuit-breaker panel with twist-lock receptacles wired in series with by-pass switches to allow connecting of future dimmers, to a complete dimmer control board with electrical mastering and an interplugging panel.

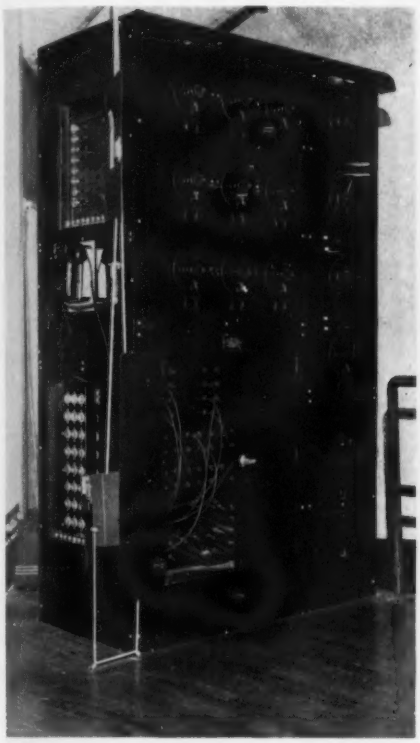
Portable equipment — 1. Spotlights for lighting the acting areas with high intensity (which should be focused-pattern type for mountings in the auditorium ceiling openings to light the front acting areas, and the soft-edge type for mounting on the first light batten behind the proscenium arch to light the rear acting areas). 2. Border-light sections for mounting on the first and second light battens to give general illumination with low intensity. 3. Backing floodlights. 4. Cyclorama floodlights.

Accessory equipment — 1. Floor stands. 2. Extension cables. 3. Multiple boxes. 4. Gelatine filter sheets.

In the particular installation for the Convent of the Sacred Heart, original purchases were made for the permanent facilities and the control board, with only a first installment on the next two items of portable equipment and accessory equipment.

The permanent facilities in this installation consist of wall pockets set above the auditorium ceiling openings and recessed in the backstage side of the proscenium wall, floor pockets recessed in the stage floor, two light battens and raceway assemblies and three sections of disappearing footlights installed flush with the front edge of the stage floor. The pockets and raceways are equipped with 20-amp. twist-lock receptacles in which terminate a total of 40 stage circuits, which will thus allow the flexibility of mounting and connecting any lighting unit in almost any part of the stage house or auditorium ceiling.

The control board is of a new type developed by Carl Schammel and George Smedberg and although a stage of this type should have approximately twenty dimmers, a compromise was made for one with three 4,500-watt and nine 1,500-watt capacity units. This control board uses non-interlocking variable autotransformer dimmers combining small and large capacity units so that by special circuiting one has a choice of using the total number as independent dimmers, or can electrically master the small units with the large units, thereby achieving electrical proportionate dimming—the desired goal for the most elaborate boards. Thus the usual expensive investment in the assembly required for mechanical interlocking, which can be of no other use, is replaced by a means of mastering which can also be used part of the time as an



New type simplified control board permits wide variety of dimming control

Six-foot borderlight sections, fresnel lens spots and cyclorama flood can be used in any combination desired on the battens or in auditorium ceiling opening

additional dimmer. It also incorporates a small and compact interplugging panel of the single-wire type so that any of the stage circuits can be plugged into any dimmer desired, or can be plugged into a hot switched circuit, or can even be transferred at full intensity without a flicker from a dimmer to a hot circuit to allow further use of that dimmer in controlling another circuit during the same scene on stage. By means of a transfer switch, each dimmer circuit is divided between two groups of paralleled receptacles, thus giving the equivalent of a one scene preset.

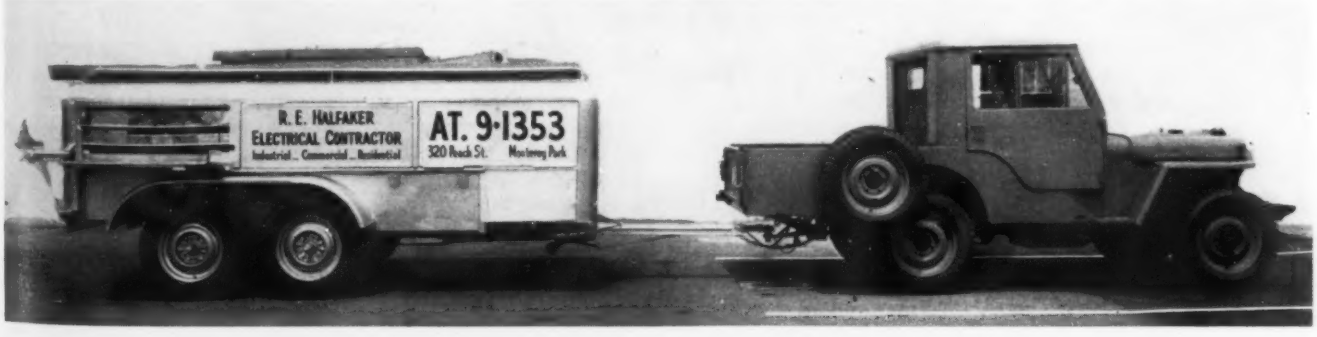
Only the first installment of recommended portable equipment has been purchased so far. Under these circumstances, fresnel lens spotlights of the soft-edge type are being used in the auditorium ceiling openings instead of the focused-pattern type and, because of the present shortage of equipment, only two for each side are installed instead of the total of six that should be used for a stage of this width. On the light battens back stage are mounted the balance of the fresnel lens spotlights, as well as the recommended total of six-foot long borderlight sections. There are also some cyclorama floodlights mounted on the third upstage batten. The pictures show the flexibility of mounting that is possible with this system. The borderlight sections, for instance, have been distributed, three on the first batten, two on the second and one on the third, and spotlights have been mounted on both battens one and two.

The accessory equipment, so far, only consists of the minimum of two floor stands, an assortment of gelatine filter sheets and some extension cables.

In modern stage practice more use is made of spots with controlled patterns to give modeling and color to the scene and actors than foots and borders. The latter, when used at all, are used to blend the over-lapping pools of light and set the color mood.

Architect for the Sacred Heart Academy was Angus McSweeney. Installation was made by Associated Electrical & Mechanical Co. of San Francisco.

Ray Halfaker, Monterey Park electrical contractor, is amazed himself at how much his Jeep and trailer will carry to any job, up hill or down, at 18 miles per gallon. It contains bins for wire, fittings, lamps, switches and circuit breakers, and many tools; space underneath for fluorescent fixtures and lamps, and conduit racks on top for ladders. In fact there is everything needed for home, range or lighting wiring and installation at the job at all times



A FOREMAN AND THE PLANS— What He Should Know and Do About Them

A foreman, upon being handed a set of plans, should know on sight just what type of building is being planned, namely: Class A, Class B, and Class C. There are modifications of these, the concrete and steel reinforced, mushroom reinforced type is usually slab construction. The beam and column type may be slab construction, or it may be furred and there is the steel column and truss type. Heavy industry uses mill-type construction which is wood. Office buildings are usually steel frame concrete fireproofed and are usually furred.

You should be familiar enough with these types so that you will instantly recognize any given type. A careful study of the plans, both as to elevation and detail will give you furring information.

Plans

Ask for, or rather demand, the plans prior to going to the job. Get a picture of the job in your mind. Upon arriving at the job you will be ready to direct the men under you intelligently and with decision because you will know what you intend to do.

Look over all plans in the building superintendent's office, especially plumbing, heating and ventilating. They, many times, do not match. Heating ducts will be shown where electrical outlets are. Plumbing and electrical drawings will conflict. It is better that you find this out so that you can adjust your plans to the others, so that you do not waste material or time. It is better to find this out ahead of time than to make the changes later. It immediately stamps you in the eyes of the other foremen on the job as a man who knows his business. Experience has taught us that the electrician is usually the "fall guy" for any moves and changes.

Do not worry about complicated hook-ups on controls. You are not supposed to know all of them. You are only supposed to be able to read schematic drawings. Do not confuse your thinking by worrying about these hook-ups and controls. The important thing is to get your conduit layouts and your board layouts at the beginning. The other items such as hook-ups will fall in line. Also, be big enough to realize that no one man can have every hook-up in his mind, and that you have a shop back of you. Be big enough to call for help and expect to get it.

In looking over the plans do not forget elevations, sections and details. This is very important and gives you an idea of your ceiling height. It also tells you whether you have metal lath with plain plaster, or metal lath and acoustic ceiling. It also gives you floor elevations. Look out for these floor elevations, they change often in industrial jobs.

You have numerous conduits to be located in foundations and switchboards. Make a template of plywood and be careful of anchorage and base lines as well as vertical supports. Switchboard templates can be sent to the shop so that knock-out centers for panels can be installed correctly in the shop.

Try to eliminate off-sets and complicated bends wherever you can. They look nice, but cost money not only to make, but to pull wire through. It is far better to spend 30 minutes in finding a way not to bend a rack of conduit than 30 hours in making the bends.

Learn to break your job up into small pieces and put these pieces on paper to give to your men to work by. Pieces can be pieces of the same system or can be the different systems that go into a job. This procedure saves lots of talk and, later, many arguments.

Above all, think and keep thinking about your job. Many problems that come up are easier to solve if you just think them out cooly. Use foresight, foresee your wants ahead of time. If your job is big enough, organize it. Set up your job storage so that you know where everything is. Organize your tool situation so that someone always looks after the tools.

Remember that you are a foreman because somebody hires you as a foreman. Do a good job, but to have the shop have to worry about you and serve you excessively lowers your efficiency as a foreman. Remember, that as a foreman, you are our front-line contact with our customer. As such, you must use judgment in handling a customer. It is not your place to fight with him. We do not fight with customers. If something comes up that you do not feel able to handle, call the office. Above all, do not accept verbal orders. A customer does not respect you if you accept verbal orders.

When a customer gives you an order to make a change, take your order book and ask him to sign it for the change. If he does not wish to do so, do not argue with him, phone the office and explain the circumstances. In nine cases out of ten, they will sign the order if they have the authority. If they do not have the authority, it is not an order. Remember always, that a person with authority to give orders wants those orders written and he will respect you not only as a foreman, but as an intelligent representative of the firm that you work for by the very fact that you ask him to sign the order.

Another item which goes to develop job organization is: Develop an understudy, someone who can take over if you are called away, or are sick, or who, when the job is practically completed, can finish the job so that you can take on another.

One reason why you are foreman is that you have a head and use it. It is easier to use your head a lot than your hands uselessly.

Second session of the Foremen's Forum held at the Charles A. Langlais Co. office discussed the question of what to do about the plans for a job. This paper was presented to the foremen present by one of the staff of this contracting firm, and then was followed by a lively discussion of the entire subject. Each foreman felt that what today was his problem might be some other foreman's tomorrow or next week. To become better foremen each could learn from all. Foremen are a part of management and need to know its point of view. See the two previous articles, December 1947, p. 68 and January 1948, p. 64, and watch for the next, on handling men.

NEW MERCURY STREET LIGHTING

Greeley, Colo., has first ornamental street-lighting system using 20,000-lumen mercury units in U. S. Total of 167 units spaced 133 ft. apart, 4 at intersections, are mounted 33 ft. 7 in. above the 76-ft. street, step up lighting 22.5 times

Medford, Ore., has replaced 35-year-old 120-watt units with 32-16,000-lumen mercury units mounted on 6-ft. arms 32 ft. above the street, spaced three per 220-ft. block. City pays $304 monthly for interest, operation and maintenance

North Sacramento, Calif., now has 66-20,000-lumen mercury units lighting its 5,600-ft main thoroughfare, replacing 13-2,500-lumen incandescent units. Mounting is 4 ft. in from, 33 ft. above curb, poles spaced 170 ft. on each side

Spokane's Bon Marche

When Bon Marche converted two Spokane buildings, six floors of the Wright Bldg., and four of the Walsh Bldg., to create a new store, Chamberlain Electric Co. had to use all the ingenuity (as well as all the Wire-mold in the Northwest) that its long experience in contracting had developed. New Trumbull switchgear, with a 500-amp. main switch, and bus gutter between the two buildings, were the electrical foundation upon which complete new lighting and electrical facilities branched forth. Type T wire was used throughout the entire installation.

Main floor of the swank new Bon Marche has two coves as shown in the illustration. Two strips of cold cathode give indirect illumination from these ceiling light boxes. Downlight for the display cases comes from 500-watt Pittsburgh Permaflectors, inset in the canopy. Revere spots with PAR 150-watt lamps hit particular areas. Showcases are lit by Hub showcase fixtures. Average general intensity on the first floor is 63 ft.-candles.

The Palouse Room, a luncheon room on the rear mezzanine floor, was designed by Ken Storment, Spokane architect, and Elmer H. Smith, Westinghouse lighting engineer, to have "clouds" in a "sky" of custom-made cold cathode indirect lighting (pink) furnished by Baldwin Neon Signs, for general illumination. In the "clouds" are incandescent downlights behind frosted glass, to light the counters.

The kitchen is all electric, has 92 kw. of cooking equipment and 80 ft.-candles of light from 16 commercial fixtures. Germicidal units are also mounted on the walls.

Other floors use standard Westinghouse fixtures with four 40-watt fluorescent lamps in 8-ft. lengths between which a Revere louvered reflector flood is mounted for accent lighting. In the rug display section incandescent spots on stems using PR 38 spots are directed on the rug racks.

Jim Chamberlain, son of G. N. "Jack" Chamberlain, supervised the contract. Fred Albert was general foreman and Homer Michels and Glenn Childers were foremen on the job, which had from 15 to 30 men on it for 15 months.

Cold Cathode Neon Mural

More than 2,000 ft. of cold-cathode neon tubing of various sizes were used for this neon-lighted mural in San Diego, said to be largest in the country. Among the many colors used by California Neon Products Co. to delineate the 63 x 58-ft. scene and borders are browns and tans, unusual in neon lighting. Some of the tubes are of two-color glass, the rear serving to illuminate the mural. On the rear of the seven-story structure which houses the administration and service center for the theater is a 60 x 50-ft. tilted screen. Water-cooled projectors used are rated at 180 amp. each, said to be the largest now in service. Size of the mural is shown by comparison with the 26½-ft. peon leading the oxen.

Secretary Carl Baldridge, President W. A. Hopper and Mrs. E. S. Mulliner

Idaho Contractors Learn About Their State Law

First convention of new state association meets in Boise

FOR a one-year-old, the Idaho State Electrical Contractors' Assn. proved itself a husky youngster in the first annual meeting of the association, representing all parts of the widespread state of Idaho, at Boise, Feb. 16 and 17. Under the wise, good-humored, capable leadership of William A. Hopper, Gem State Electric Co., Boise, president, 76 contractors of a total attendance of 103, learned the status of the Idaho State Electrical Code, learned what an association could and could not accomplish, heard inspirational messages from representatives of other branches of the industry, held open discussion of apprenticeship and developed the feeling of fellowship among contractors throughout the state in this memorable meeting.

The Idaho State Electrical Code, passed last year and now being implemented, naturally was the subject of most concern. J. Carl Baldridge, loaned on leave of absence from Idaho Power Co. to the state as chief inspector, as well as secretary of the association, reported experiences so far with the law. The state board had had a meeting on Sunday preceding this convention and authorized him to find eligible men for inspectors.

There have been 32 meetings of contractors throughout the state, reaching a total of 653, plus personal contacts, to explain the law and to speed up licensing under it. He said he was authorized to approach city councils with a view to setting up inspectors among adjacent groups of small towns. Describing the work that was necessary to pass the Idaho law, he warned that it could be voted out a lot easier than it was voted in, if it didn't have the full support of the contractors association.

Eli Weston, attorney, who had just been to the attorney general's office for an opinion, declared the law needed clarification at the next session of legislature. Since all cities get authority from the state, any local ordinance is valid if it doesn't conflict with the state law. Any incorporated city that has a good inspection ordinance and set up would be unaffected except that the attorney general gave the opinion that a state license was all that would be required to do work anywhere in the state. It was his opinion cities could not have examinations for local licensing. It could obtain inspection fees but not licensing fees. Weston suggested starting at the local level with cities, and next year changing the law to provide inspection throughout the state, something on which the present law is vague.

Mrs. Estella S. Mulliner, director of the Bureau of Occupational Licenses and hence the state licensing law, spoke briefly, saying there had been very little protest over the licensing law. There have been 800 licenses issued, 60 more are being processed and quite a number are waiting for an examination. The electrical board, she said, serves without pay.

Before the close of the meeting, H. F. Koch reported on the state board meeting. Much of its work was administrative, he said. However, examinations for licenses for journeymen and contractors will be held the first Monday of each quarter, the first to be in April. The board decided on a standard type of examination in every district to prevent "hedge hopping" by those who failed to pass the examination. It authorized Baldridge to try to find two inspectors. It likewise authorized temporary permits for journeymen pending examination. In towns not large enough to employ their own inspector, it authorized Baldridge to contact several adjacent towns with a view of employing one inspector for the group.

Other matters concerning the state law included discussion of how to report violations and make complaints and some strong straight talk from President Hopper on the work needed before the legislature meets in the fall. He urged local meetings in towns and once a quarter in each division. He said contractors should be known as a force in their communities and take active part in all civic undertakings. The worst trouble, he said, may come from members of their own trade who are not informed on the law's value.

In greeting the convention, Mayor Potter P. Howard of Boise advised the group to give mayors and councils the benefit of all the information they need before passing of any ordinance. He also urged contractors to back up vocational training—"You fellows aren't going to live forever. A lot of this GI training is not worth a damn. Help make it possible to give training to men in things you are doing."

Advice on what the association could do came from two speakers. Leon Weeks, secretary of the Intermountain Hardware and Implement Assn., said that organizations such as this could protect members from unfair practices, give constructive leadership, protect the economic interests of the customers and advance the welfare of the association through publicity. He cited that many union members pay $1.50 a month or more dues, yet do not have the investment in the business that the contractors have. Thus he urged adequate financial support of the association. All aims of the organization, he emphasized, must be for the ultimate benefit of the public.

Often members ask what an association is accomplishing, failing to realize that one of the prime purposes is to prevent something from happening. This is not obvious and is hard to appreciate, but some action of other groups which might hurt this group can often more than pay the dues for

a member for the year. "Other organizations, like ours for instance, may have legislation which they think would benefit them but would hurt you. You can watch such things. Often you can revise it so that neither of you is hurt."

What An Association Can't Do and What It Can was discussed in some detail by William A. Cyr, ELECTRICAL WEST. Setting down the things which contractors organizations talk about and think they want, such as dictatorships, price fixing, rules of conduct and allocation of jobs, control of competition, bid protection, labor protection, protection from manufacturers, jobbers, utilities, government, legislation, sales promotion, fellowship and miracles—each one was discussed in turn as to what could and could not be done. He urged a constructive rather than merely a protective attitude and said that associations, as a part of the democratic way of life, should be made to work successfully for the larger purpose of proving the superiority of such a way of life to that of dictatorship.

Representatives of the three utilities serving portions of Idaho in which members operate, gave messages of inspiration and assurances of help to the association.

Speaking for Ralph Gale, general sales manager, Idaho Power Co., who was absent, Earl A. Olson, sales manager, spoke in particular of the rural market possibilities for 1948. Of the 41,500 farms in the state, 32,454 have electric service or are within a quarter mile of it and farm income for the state will be $350,000,000 in 1948. He urged that the contractors make a strong selling effort to gain their share of the one-third of farm income that is spent for equipment and implements. Such a market will represent $1,000,000 in wiring if it is sold, $6,500,000 in appliances and $80,000 in motors and power tools, with additional markets for farm machinery and wiring of new buildings. This will represent 28 million kilowatt-hours to the utilities and two or three million dollars in profits to the manufacturers and labor wages.

Homer C. Bender, The Washington Water Power Co. and chairman of the Adequate Wiring committee of the Northwest Electric Light & Power Assn., opened the Tuesday morning session with greetings from that company, which serves the northern end of the state. He spoke of the need for legislation to outlaw unsafe electrical appliances, declaring Washington and Idaho the dumping grounds for unsafe equipment that cannot be sold in California or Oregon. He urged 100-amp. service entrances for all houses

Top: H. E. Steele, instructor at Farragut Institute; W. A. Hopper, president, Boise; W. R. Reed, Idaho Power, Convention chairman; Carl Baldridge, state inspector and secretary; Leon L. Weeks, Intermountain Hardware & Implement Assn. Center: Discussing apprentice training, Ernest Hartley, Malad; J. M. Evans, Malad; Ronald Langford; Les Johnson, G-E, Salt Lake City; Leslie Billing, American Falls; A. D. Hill and J. R. Morton, Idaho Falls; and Wally Wright, IBEW vice-president, from Pocatello. Bottom: Don Stewart, Fillmore, Utah; Russell Sullivan, Weiser; Jack Schwartz, Payette; Ed Jones, Grangeville; A. H. Reeder, Gooding; F. H. Pollard, Kimberley; and Don Smock, Twin Falls, Idaho These pictures were taken during the informal dinner the first evening of the convention, which was attended by members and their wives and the industry

and said that all merchants should be sold the value of wiring. As to cost of wiring, he suggested giving the customer a choice of a code minimum job and a standard wiring layout of better quality and adequacy. In the WWP territory, contractors and the utility run a large ad each month on adequate wiring. He urged support of the Retail Lumbermen's Assn. program of an engineered home.

J. F. McAllister, Utah Power & Light Co., Salt Lake City, commended the organization for the fellowship which it was engendering and the inspiration it was providing. "The rest," he said, "is what we make it." The UP&L has only cooperation to offer. It has two men who devote their time to assist contractors, dealers, and the public and tell them the latest in wiring. In the past, he said, contractors have sometimes resented utilities, but the power company offers its help, not by way of domination but to elevate the entire business.

Speaking for the wholesalers and dealers, R. S. Belnap, manager, General Electric Supply Co., Boise, defined the services offered by the wholesaler distributor and how the contractor could aid himself to get better service by buying intelligently, becoming familiar with local markets and acquainting the wholesaler with them so he can better serve him, familiarize himself with reliable sources of supply, keep abreast of new products and devices, make it easy for customers to use his services and keep his customers satisfied with good materials, good workmanship, at reasonable prices. With building costs so high that they may price the industry out of the market, he said all must work together to remove restrictive local rulings that serve only to confuse, must stop underselling just to get a job, as a shortcut, and must do more intensive selling. The appliance dealer, he said, was a logical customer for the contractor. "If you don't give him this service, he will find some other method of getting this work done."

Lester B. Johnson, General Electric Co., Salt Lake City, reviewed early efforts to form the contractors association in Idaho and then discussed the characteristics of fluorescent and cold cathode circuits. He predicted that since more slimline will be used built-in, that ballasts should be placed in accessible cabinets, remote from the fixture, and wiring be done in 1,000-volt wire. As an approach to the selling of lighting, he suggested that it be sold on the basis of so much per square foot, because office space is rented on such a basis. He urged joining the IES to obtain lighting data and the inspectors association for code information.

Stanley M. Johns, Westinghouse Electric Corp., brought in a completely different note when he reviewed swiftly and eloquently the marvels and improvements in electrical equipment since the end of the war. He touched on radar, high-speed X-ray, lighting, huge circuit breakers and higher temperature turbines, larger and smaller motors, television, jet propulsion, gyroscopic stabilization for trains, beam casting with talking lamps and what the program for developing of substitute fuels from the coal beds in Utah, Wyoming and Montana would mean to the electrical industry. President Hopper added, "You just can't neglect your studies. You are never through school, if you want to keep up with this fast-moving electrical industry."

From other organizations came several speakers. Pat King from Idaho Insurance Rating Bureau described the method whereby cities and then individual houses and buildings are rated for insurance. Electrical installation is not a major item, he said, and the insurance companies are at the mercy of the electrical industry. If a town has an ordinance patterned on the National Electrical Code, it gets a better rating. He said electricity is much maligned as far as fire hazard is concerned.

William J. Varley, manager, San Francisco Chapter, National Electrical Contractors Assn. and representing NECA at the meeting, spoke of some of the work that NECA does on national legislation, on endeavoring to secure electrical work in large projects for electrical contractors, trade and distribution problems at the national level, escalator clauses, etc. He said that soon a new field representative of NECA, E. R. Cornish, would visit that state and assist in organization where he could. He later made a very strong plea for active committee participation in the apprenticeship training program, showing that the manpower on which the future of the industry depends must come from well-trained apprentices now. Apprenticeship training, he further declared, was a moral responsibility to the GI and was something contractors must accept and participate in.

W. C. Wright, international vice-president, International Brotherhood of Electrical Workers, Pocatello, and a member of the Idaho Chapter of the National Safety Council, spoke principally on the latter. He said this organization showed that labor, industry and management can get together if they are sincere. He said this council is studying various state safety codes with a view to developing one for Idaho. He explained the procedure for the formulation of a code. Wright also urged participation in the apprentice program because the trade is definitely in need of real mechanics. He said the union has lowered the ratio of journeymen to apprentices as an aid in this program and is doing its share in the committee activity. Wright reviewed many of the prospective projects in the region and the need of home building, and predicted the necessity for electrical work that would defy a recession.

Paul Wise, representing the Building Industries Section of the Associated General Contractors, invited the organization as well as other crafts to join. He set forth the aims of the organization in the maintenance of high standards, protecting of legitimate markets and working to reduce high costs of building.

T. G. Steele, electrical instructor at the Farragut Institute in northern Idaho, discussed briefly the electrical program which is being set up there to provide schooling for apprentices, refresher courses for journeymen and business courses for contractors. This institute's program was discussed at some length. Steele, however, said the program was just now being developed and asked the assistance of contractors in improving it. President Hopper criticized most school training for not making it plain that students are only ready to begin an apprenticeship when they come out. Many feel that a two-year course should give them a two-year apprentice rating without the practical on-the-job training that is necessary.

Despite his plea for more time to spend at being a grandfather, W. A. Hopper was unanimously re-elected president, as were the other officers, E. W. Hall, Pocatello, vice president; T. L. Masingill, Payette, treasurer, and Carl Baldridge, secretary. A change in the bylaws permits an extra director as well as a district chairman for each of the four districts and the following were elected: District 1—John Nannenga, Lewiston, chairman; C. H. Furman, Coeur d'Alene. District 2—H. F. Koch, Boise, chairman; R. A. Shumate, Nampa. District 3—Don Smock, Twin Falls, chairman; A. C. Victor, Jerome. District 4—L. W. Billing, American Falls, chairman; Glen Herdti, Rexburg.

The convention committee, headed by W. R. Reed, Idaho Power Co., was highly commended for the arrangements made for the convention. On that committee, handling the banquet, was P. H. Forte; Maynard Smith, Graybar, reservations; A. E. Anderson, registration, and H. F. Koch, program.

Quick Catch-up

IAEI

Organization of the Northern California Chapter, IAEI, for the year's activities was announced by Chairman James Ambrosi of Oakland, at the first meeting of 1948, in Redwood City, Feb. 7. As the host chapter for the 1948 annual meeting of the Southwestern Section at Oakland in September, the Northern California group is preparing for that event far in advance.

D. H. Hansen, Oakland's chief inspector, was named chairman of a code interpretation panel; Walter R. Keller, Santa Cruz, of programs and entertainment; W. A. Cyr, ELECTRICAL WEST, of publicity and attendance; Leo Kass, Pacific Gas and Electric Co., Oakland, of uniformity of ordinances; C. McClelland, Division of Industrial Safety, of membership; and Charles J. Foehn, business manager, Local No. 6, IBEW, of a committee on salary adjustments.

The main topic of the meeting was a proposed revision of Article 430 of the National Electrical Code, referred to the chapters by the convention at Riverside for study. Finally the proposals were referred to the code interpretation committee for more study.

A General Electric movie, *Clear Waters*, was presented after the noon luncheon. Built-in lighting fixtures close to combustible materials and wire temperatures also evoked discussion.

Southwestern Section President Harry Moore of Modesto invited the chapter to a joint meeting of the three chapters in northern California at Modesto, April 17.

Prefabricated house wiring came in for discussion and demonstration at the Jan. 28 meeting of the Southern California Chapter IAEI in San Diego, at which Chairman Ken Howard of South Gate asked that some assurance be provided that concealed wiring meet code requirements. Charles Donahue, newly elected chairman, was initiated into his office. Herbert Ufer, Underwriters' Laboratories, declared that this organization was ready to inspect and label panels of prefabricated houses that are wired to comply with the code. It would be up to individual cities to decide what wiring methods were acceptable.

William Falstrom, Southern California Homes Inc., displayed aluminum alloy raceways used as part of the wall base sections of his company's prefabricated houses for wiring and receptacles. If approved for a raceway by UL the inspectors saw no reason to object to this method.

The next meeting will be held at South Gate on March 24, and the May 26 meeting, as is customary, will be held at Long Beach.

Central California Chapter IAEI held its Feb. 14 meeting in Fresno, under L. B. Sterling, chairman. J. R. Lazarus, Pacific Electrical Assn., talked on the Uniform Electrical Code; Harold L. Gerber, former San Francisco inspector and now consulting engineer, discussed some code problems and Herbert Ufer, Underwriters' Laboratories, explained the purpose and work of that organization.

Idaho Chapter IAEI will hold its annual meeting at Pocatello, March 31, at Bannock Hotel. It will come in the series of Rocky Mountain region meetings—the Rocky Mountain Chapter at Denver, March 25 - 26, Utah Chapter, Salt Lake City, March 29-30; Idaho Chapter, Pocatello, March 31; Montana Chapter, Great Falls, April 2-3. Programs are still in the process of formation.

EMEA

The Second Annual Industrial Electrical Show sponsored by the Electrical Maintenance Engineers Assn. will be held at the Los Angeles Armory March 18-20. This year's event is expected to draw even larger attendance than the 7,000 persons who attended EMEA's first industrial electrical show last year. Tickets are being distributed by exhibitors and by EMEA through allied electrical associations.

EMEA of Southern California has elected Henri Ledeboer, 20th Century-Fox Film Corp., to serve as its president during 1948. Homer M. Eversz, McCulloch Motors Corp., was elected first vice-president and William H. Slater, Emsco Derrick & Equipment Co., was elected second vice-president. Frank J. Rohring, Southern California Edison Co., will serve as secretary-treasurer. New members of the executive committee are: Harold S. Davis, General Electric Co.; Earl S. Mollenkoph, Hoffman and Jacobs Inc.; Bob Paden, Los Angeles board of education. Holdover members of the committee are: John Davis, Douglas Aircraft, and Ray C. Gunning, R. A. Reed Electric Co.

The same group recently met at the Rodger Young Auditorium to hear a talk by Robert G. Wessner, electrical engineer on an all-electric adjustable speed drive. He described how adjustable speeds are obtained electrically from a-c circuits.

Northern California Section heard H. F. Wells, sales engineer of Reliance Electric & Engineering Co., discuss the application of variable voltage and adjustable-speed drive in modern industrial plants.

IEA

New president of the IEA is Howard W. Price, assistant manager of Salt Lake Hardware Co. The other 1948 officers elected are: E. M. Royle, vice-president; J. F. McAllister, secretary-treasurer; Carlos W. Stone, manager. Board of directors from the various chapters include: Cache Valley—V. L. Ferrin of Logan, Utah; Ogden—

Both the Southern California and the Northern California Electrical Maintenance Engineers associations are readying for their big electrical shows—in Los Angeles Armory, March 18-20; and in California Hall, San Francisco, April 2-3. Last year, Tone Gray, president of the northern group (extreme left) visited the Los Angeles industrial exposition to see how they did it. The officers gave him the entire story and posed with him in this picture. Next to Gray is Mike Eversz, chairman of the 1947 show committee; Clarence Miller, Henry Bush, Marion Allen, executive secretary; W. H. Carter; Emerson S. Reichard, president; L. L. Warner; Henri Ledeboer, just recently elected president, and John Zuponcic. All are active in this year's big events in both parts of the state

Stephen J. Donoviel, Ogden; Salt Lake Retail—Robert Nevins; Sevier—Frank Parks; Southeastern—P. J. Bowman, Helper, Utah; Utah—Eldon G. McKell, Provo, Utah.

Representing contractors: Jack Jacobs of Apex Electric Co.; Douglas Peck of Peck Electric Co.; Jack Laub of Cache Valley Electric Co.

Representing manufacturers: W. L. Moats, Westinghouse Electric Corp.; Dale P. Randall, Western Sales Service; Dean N. Jenks, General Electric Co., lamp department.

Representing retailers: Clarence W. Gilner of Gilner Electric Co.; Henry W. Richards of Granite Furniture Co.; E. M. Royle of Royle Radio Co.

Representing utilities: W. A. Huckins of Utah Power & Light Co.; Ora H. Barlow of Mountain States Tel. & Tel. Co.; Paul P. Ashworth of Telluride Power Co.

IEA sponsored a television preview at a dinner meeting held on Feb. 24 at the Hotel Utah. The association gave a 45-minute telecast over its new station W6XIS. The new station will soon be on the air for regular telecasts. On hand to answer questions were S. S. Fox, John M. Baldwin, and Harry Golub, all from the Intermountain Broadcasting Corp.

RMEL

Joseph I. Wright, recently appointed "Go-All-Electric" representative of the Rocky Mountain Electrical League, has gone all-out on a dynamic itinerary of Colorado, leaving in his wake an aroused industry fully sold on the program he promotes and the practical implications thereof. Neither storms, polar temperatures, nor transportation difficulties stopped him on his trip from Denver to Grand Junction, Montrose, Durango, Salida, Leadville, Greeley and other points where he met with dealers, distributors, and utilities representatives, to plan activation of the national program to "electrify" customers.

Part of "Joe" Wright's effective approach was the film, *Ingredient X*, shown by Meryl Mentzer, RMEL's adequate wiring specialist, which demonstrated the efficiency and economy of electricity as contrasted with other fuels. Chart-type cards as dealer aids in explaining operating costs on some 50 domestic electrical uses also helped streamline the channeling of energy-powered equipment from manufacturer to ultimate purchaser.

Forty-eight dealers, under auspices of Western Colorado Power Co., gathered at Montrose to hear Joe. Approximately the same number, similarly sponsored, were at Durango the following night. Thirty-two well-frozen

Wright

electrical store operators congregated in Greeley, on the same mission, with the thermometer at 15 below zero.

Unable to cover all of Colorado in one month, he was picking up the loose ends in February, meantime hitting strategic points in Wyoming and South Dakota. His zeal is contagious.

Housing shortage delayed Rocky Mountain Electrical League plans to schedule the annual spring conference embracing engineering, auditing, sales and contractors' sections. Art Prager finally came up with the solution with reservations at La Fonda hotel in Santa Fe, New Mexico, April 22 and 23 . . . At the same time, Ralph B. Hubbard, RMEL manager, announced the annual fall convention for Sept. 12-15 at the Colorado Hotel in Glenwood Springs.

IES

The Washington State Chapter of IES has changed its name to Puget Sound Chapter. Name change was required due to the formation of the Inland Empire Chapter IES which had its inception in Spokane the latter part of February. Special delegation from the Puget Sound Chapter attended the formal opening of the Inland Empire Chapter.

Utah Chapter heard George Gilleard tell about the new look in lighting at its regular monthly meeting. New publicity chairman for the Utah Chapter is A. L. Leick.

To aid Sacramento to form a chapter of the Illuminating Engineering Society, H. H. Robison, chairman, Northern California Section, and Dr. Leland Brown, regional vice-president, took a program to that city Jan. 28 in cooperation with the Sacramento Electric Club. Besides Robison and Dr. Brown of Stanford University, John S. Walsh, Pacific Gas and Electric Co., and W. A. Cyr, ELECTRICAL WEST, addressed the 90 present, telling of progress in lighting equipment during the past year. Clark Baker Jr., president of the Electric Club, turned the meeting over to Al Purdue, commercial and industrial sales manager, Sacramento Municipal Utilities District, who acted as chairman. Dr. Brown discussed the aims and activities of IES.

American Society of Heating and Ventilating Engineers

Main feature of the 54th annual meeting of the American Society of Heating and Ventilating Engineers in New York was a symposium on the heat pump for year-round air conditioning. A description of a heat pump installation was presented by J. Donald Kroeker and R. C. Chewning of Portland, Ore. (ELECTRICAL WEST will run a story on the heat pump installations in the Equitable and Oregonian buildings in Portland.)

National Association of Refrigeration Contractors

At the annual meeting of the NARC held during the 5th All-Industry Refrigeration and Air Conditioning Exposition, new officers and directors were elected. J. H. Lessard of Seattle was named second vice-president. Lee Shirar of San Francisco was appointed a director. Included in the list of speakers during the morning sessions of the meetings were Zed Jones of San Francisco, and Art Carney of Seattle.

Electric Clubs

Arthur Bragg, General Electric Co., was elected president of the San Francisco Electric Club for the year beginning March 1, 1948, succeeding Herbert Atwater, Leo J. Meyberg Co. J. R. Lazarus, PCEA, was re-elected secretary-treasurer, and Arthur Dahl, General Electric Supply Corp., Willis Winter, Westinghouse Electric Corp., and Harry A. Lee, Pacific Gas and Electric Co., were named directors.

San Diego Electric Club recently installed Frank Perath of San Diego Gas & Electric Co. as its president for 1948. He succeeds Ronald T. Strong of Westinghouse Electric. Other officers elected are: J. F. Sinnott, first vice-president; William McKinley, second vice-president; Cliff Saunders, secretary-treasurer. New members of the board of directors include H. O. Craghead, William E. Davis, James Lyon and Marvin T. Strong. The installation

Several old-timers of the industry in Portland were honored recently by the Northwest Electric Light & Power Assn. through presentation of honorary life membership certificates. The awards were made at a meeting of the Portland Electric Club by Berkeley Snow, association secretary, who recited a short history of the careers of each of the recipients. They were (from left) Charles P. Osborne, formerly general superintendent of Portland General Electric; Orrin B. Coldwell, former vice-president of PGE in charge of engineering, operation and construction; Franklin T. Griffith, former PGE president, whose recent resignation as board chairman of that company ended active participation extending more than 53 years; A. Craig McMicken, general sales manager, PGE; Roy R. Robley, former assistant to the vice-president, PGE, and active in the engineering and operation end of the business; Guy W. Talbot, organizer and first president of Pacific Power & Light; Francis H. Murphy, formerly PGE illuminating engineer, now in consulting practice in Portland. Others receiving the honor but not present at the meeting, were: Louis T. Merwin, former president of Northwestern Electric, now vice-president of Pacific; Lewis A. McArthur, Pacific company vice-president; E. G. Robinson, former owner and operator of several small companies in the Pacific Northwest. The association has honored 31 such old-timers from different parts of the Northwest, from 1919 to 1947. Certificates read "for meritorious service to the electrical industry in the Northwest and to the association." Such awards are now made generally only to persons retired or about to retire from active services in the industry.

ceremonies were held in connection with the club's annual dinner dance on Feb. 6.

Guest speaker at a recent meeting of the San Diego club was Dr. David C. Kalbfell, head of Kalbfell Electronics Laboratories of San Diego, who spoke about top-notch recording, explaining what's behind the high quality reproduction of music . . . another program featured the movie *Watts in Glass*, a sound color film depicting the role which electrical insulation is playing in American enterprise.

East Bay members presented R. H. Patton of Westinghouse Electric Corp. of San Francisco, who explained a program for helping young people who are qualified for scholarships in the scientific field.

Dr. Gerald Wendt, editorial director of *Science Illustrated*, addressed the San Francisco Electric Club on new electric ideas in science and also discussed the social influences of television.

NECA

Rocky Mountain Chapter, National Electrical Contractors Assn., organized a branch at Colorado Springs in January. Eleven members there set up the branch. Another meeting to discuss jobber and fixture sales policy was held with manufacturers and jobbers at Denver in January. On Feb. 2 a general meeting was held at Denver Athletic Club to discuss with Cliff Noxon, regional director, the apprenticeship training program. Scheduled for March 1 was a meeting at which General Electric Supply was to act as host. Plans are being made by Don Larson, manager, for an architects and engineers seminar at the Electric Institute, April 12-19-26 and May 3. Speakers are to be Harold Rankin, Public Service Co. of Colorado; Howard McAllister, G-E; Victor Moulton, Mountain States Inspection Bureau; Troy Hugart, Mountain States Telephone & Telegraph, and Ray Ashley, engineer, Chicago.

NECA will hold its annual convention at Miami, Fla., Nov. 30-Dec. 3, 1948.

San Francisco Chapter NECA has resumed its weekly luncheons, W. B. Baker, its new president, announced. Informal luncheon discussions of current matters are held on Wednesday noons, and the monthly business meeting at association offices is held the last Thursday of each month.

A big public graduation meeting for apprentices in all crafts in the Alameda and Contra Costa counties will be held at Oakland Civic Auditorium in April, Ray Carey, manager of the Northern California Chapter NECA, announced. Electrical apprentices from both counties will receive diplomas. C. Dorwin, California State Builders' Exchange, talked to the Feb. 10 meeting on pending legislation affecting subcontractors.

● In A Statement disclaiming affiliation with the Seattle Electrical Contractors Assn., which is under indictment (see Electrical West, Feb. 1948, p. 117) T. Ralph Neilson, director, said the Electrical Contractors Society of Washington Inc. is an independent group of 12 chapters, and a membership of 125 in the state, composed of small contractors opposed to the fees and policies of national associations and unions.

● Correction: Northwest Electric Light & Power Association, Accounting and Business Practice Section, will meet at the Davenport Hotel, Spokane, May 17-18 instead of in April as previously listed. The Engineering and Operation group will meet April 14-16 at the Hotel Davenport, Spokane, and the Business Development Section May 10-12 at the Empress Hotel in Victoria, B. C.

PANORAMA OF THE PCEA

Edited by A. X. Schilling

Meter Group

The meter group's recommendation that PCEA should assume the sponsorship of a committee to explore the possibility of standardizing metering installation and similar requirements was approved during the Board of Directors meeting held on Feb. 14.

The meter group discussed the problem during the Fresno Conference and since then has had an informal committee in southern California working toward standardization. The directors' approval of a formal committee now makes it possible for all utilities in PCEA territory to be brought together for discussion. The ultimate goal of the new committee will be to arrive at a basis of standardization for testing meters, for metering installations on switchboards, and related problems with a view to obtaining the lower costs made possible by standardization of such requirements.

During the same meeting, the Board of Directors also approved the report of the code and ordinance committee and that group's statement of policy.

The report pointed out that lack of uniformity of electrical ordinances among various cities contributes to higher building costs by forcing distributors and wholesalers to stock a wide variety of equipment to comply with various ordinances and by requiring builders to devote much costly time to studying the ordinances of individual cities.

The report emphasized that the basic purpose of a construction ordinance is to provide safety. However, pressure for the use of individual materials or for the creation of artificial work often adds restrictions to ordinances that inevitably add to construction costs.

In an effort to overcome such conditions, the code and ordinance committee therefore recommends that all cities and counties in California adopt the standards of the National Electrical Code. This code is approved by the American Standards Assn. and by the American Bureau of Standards, and adopted by the National Fire Protection Assn. as the electrical basis on which fire insurance rates are established. The materials and methods approved by this code are nationally recognized as being free from hazard to life and property.

In order to assist communities in adopting the national code by reference under the state enabling act of 1927, PCEA's committee developed the Uniform Electrical Code, which has been recommended by PCEA for the past 20 years. The Uniform Electrical Code applies state laws and regulations to the national code, thus making it suitable for enactment in California.

The committee's statement of policy specified that electrical ordinances should be based on safety requirements only and that methods and materials which provide for higher standards than those dictated by safety should be sold only upon their merits. The committee's policy, then, is to advocate the enactment of the Uniform Electrical Code to provide for safety, leaving the choice of materials and methods subject to open competition.

One hundred and three cities, four counties and one fire district in California have now adopted the Uniform Electrical Code.

Attending the Board of Directors meeting were: George C. Tenney, T. L. Rosenberg, C. W. Goodwin, C. C. Ernst, R. R. Walbridge, R. E. Arbogast, I. W. Borda, F. A. Tracy and H. L. Harper, directors; D. E. Harris, past director and honorary member of PCEA; Albert Cage, former director; K. M. Ryals, H. H. Cleland, W. W. Glosser, S. E. Gates and A. B. West, past presidents, and V. W. Hartley, managing-director. PCEA President H. H. Courtright presided.

Adequate Wiring

In line with its plan to explain the advantages of adequate wiring to distributor and wholesaler groups, the adequate wiring committee has sponsored a series of meetings recently.

On Jan. 30, Walt Matsinger arranged a Los Angeles meeting of 25 Westinghouse Supply Corp. salesmen to hear an explanation of the subject. V. W. Hartley introduced Elbert Kramer and outlined the part that PCEA has taken in advocating adequate wiring for many years. Kramer then described the work of the adequate wiring committee, of which he is chairman, and stressed the advantages that accrue to everyone concerned when homes are adequately wired. He was assisted in his presentation by Vere Ringle, and used a number of colored slides to illustrate his talk.

A similar meeting was held on Feb. 9, when 40 adequate wiring people from Southern California Edison Co. made an all-day visit to the Square D plant. In addition to inspecting the plant, and becoming acquainted with the firm's products, the group held a meeting during which H. C. Rice and Al Schuler, Square D general sales manager, discussed adequate wiring and the "trade secrets" of selling it to home builders.

Thirty-five General Electric Supply Corp. salesmen at Los Angeles attended a special meeting called on Feb. 16 on the subject of adequate wiring. The meeting was conducted by Lee D'Angelo, with a talk by Hal Thrane and the showing of the committee's colored slides.

The subject has been discussed a number of times during Graybar Electric Co. sales meetings, and a formal presentation of the committee's program is being planned by E. H. Galchutt.

● San Francisco Bay Area Bid Depository Inc. held its annual election late in January and re-elected Noble Wright, San Francisco, as its president, and the following as officers and directors: A. R. Matson, Oakland, vice-president; George Abbett, San Francisco, treasurer; James Galvin, Rod Newman, Everett Carlson and Clyde Chamberlin, all of San Francisco, and Walter Vance, Lawrence Maltgren of Oakland, directors.

● To Provide funds for inspections to enforce San Francisco's substandard electrical sales ordinance, a new ordinance, No. 5095, has been proposed, which would draw its funds from license fees for selling electrical merchandise.

ELECTRICAL WEST

JAMES Herbert McGraw was a pioneer in the broadest sense of the word. The very same attributes of leadership that enabled him to build a great and successful industrial publishing enterprise would have carried him to memorable heights of achievement in the winning of the West or the establishment of empires in any age or on any continent. His was the courage that counseled a virile attack when obstacles appeared unsurmountable. His faith was unbounded, for it was founded on a vision which enabled him to see farther than his fellows. His persistence was such that it was said of him that "he goes forward where others fear to tread and having started he knows not when to quit." With all of these traits of character there was mingled an almost religious spirit of service that was reflected in the integrity, breadth and idealism which he demanded of his magazines and his editors. Finally, his was the ability to inspire and enthuse through word and deed.

James H. McGraw
1860-1948

James H. McGraw began his career as a teacher and the precepts of the educator were always uppermost in his mind. He was a searcher after the truth and the incisiveness of his questioning constituted a never-to-be-forgotten experience. He possessed to a marked degree the educator's ability to build men. He had a keen perception for detecting ability and for judging character. Having assigned responsibility to a man of his choice, he himself set the example for success — hard, intelligent work and sacrifice for attainment of a goal.

While his associates will revere him for the great man that he was, industry will remember him for the things for which he stood. His career has been a clearcut model of the principles of American free enterprise at work. He was born on a farm. He worked his way through school. Sensing his first real business opportunity, he insured his life and then borrowed his initial capital on his insurance policy. Through perseverance, intense application, acumen and work, he built the foundations for a great service organization which today publishes thirty-five industrial and business magazines and thousands of technical and popular book titles.

If he had a favorite among the many industries that his publications were designed to serve, it was the electrical industry. His first magazine came out of the genesis of that business. And he realized an ambition to furnish that industry with a complete and comprehensive publishing service that reflects its vitality, its ideals, its opportunities and its destinies. Early in his business life he developed a love and an appreciation for the Far West. He saw it as a last frontier from which great things would come. He foresaw its destiny as a boundless and progressive industrial region where life held out a little more in terms of human happiness. It was for this reason that he purchased the predecessor magazine to ELECTRICAL WEST. We in whose hands have been placed this trust hope to carry on his traditions and his faith.

His was a business built of men and ideas solely. He based it upon ideals and faith and vision and this simple truism: "*Industry is always ready for leadership.*" In his day he provided a great measure of that leadership. For that he will be remembered with reverence, with love and with respect.

EDITORIAL VIEWS

IT was James H. McGraw who foresaw the electrical destiny of the West, broke his own precedent and bought the only regional magazine the company ever owned, because his keen eyes saw a separate empire in the West, made by electricity and he wanted to pioneer in serving it. And throughout the remainder of his life he was the champion of the West and of his protege, ELECTRICAL WEST, when others questioned its future. And he traveled in the West during his last years when ill health forced him to retire from active management.

Like an Alger story of success the career of James Herbert McGraw, born Dec. 17, 1860, in Panama, Chautauqua County, N. Y., begins humbly and rises to towering height. He attended state normal school at Fredonia, earning his way by teaching at the same time at a district school. When he was graduated as valedictorian in 1884, he was appointed principal of the school at which he had taught. His taste for printers ink sprang from reporting for a home town weekly. In spare time he worked for a monthly, *The Countryside*, writing a column and selling subscriptions.

Some friends started *The American Journal of Railway Appliances* and bought a little paper named *Steam*. He left teaching to go into publishing with them. He went to New York to sell subscriptions. When the company did not do well and owed him $1,500 in back pay by the summer of 1886, he was asked to find some cash to help out. Walking up Broadway to think it over he passed an insurance company building, got a bright idea, went in, took out a policy for $2,000 payable to a wealthy Quaker farmer friend of Chautauqua County. With a note and this insurance policy he sought and received a loan of $1,000 from this friend, James Knapp. With this and for the $1,500 owed him he took stock in the publishing house and became a vice-president of the concern. Two years later the company paid a 10% dividend. When his partners and he differed as to the future of Edison's new electric car, they parted company and he started his own first magazine as an independent publisher with *Street Railway Journal*, hired an electrical editor for it.

By 1901 he had acquired *Electrical World*, and *Electrical Engineer*, which he consolidated as *Electrical World*. He later added other publications and started *Electrical Merchandising*. Upon the death in 1916 of John A. Hill the McGraw publications acquired the Hill publications and the McGraw-Hill organization began with nine national magazines.

In August 1919, he came to the West and spent six weeks appraising its then raw resources and potentialities. Before he returned East in September, he had purchased the electrical publication of the West, then called *Journal of Electricity*—now ELECTRICAL WEST. In its Sept. 15 issue he wrote:

"In former years I have visited this beautiful section of our nation west of the Rocky Mountains, felt its charms, and returned to the East enthused with the vast business possibilities here. My present visit has already lasted six weeks, and in this time I have from the High Sierras to the Sea undertaken a personal inspection of what men of the electrical industry are doing here and have noticed with unusual interest the splendid vision of engineering and industrial possibilities you have in store in this growing section of our nation."

It was not until a year later, however, that he announced the dissolution of the Technical Publishing Co., and the formation of the McGraw-Hill Co. of California. Throughout his active life the staff of ELECTRICAL WEST have felt and profited by his personal interest in this protege he brought into the McGraw-Hill Publishing Co. family of magazines.

"To encourage constructive thinking for the advancement of the electrical industry" in 1924 he established by endowment the James H. McGraw Awards for Electrical Men in the manufacturing, wholesaling, contracting branches and for cooperation in promoting the general welfare of the industry.

Best testimony of what his associates felt about him is contained in a plaque presented to him and now mounted on the 33rd floor of the McGraw-Hill Building in New York City:

"To James H. McGraw: To commemorate his thirty-three years of service as a publisher, to bear witness to his vision, his ideals, and their influence on technical journalism and engineering thought; to testify to their pride in his accomplishments, their faith in his leadership, their admiration, respect and love, this tablet is erected by the men and women of the McGraw-Hill Company."

Left, largest group ever to attend the San Diego Bureau dinner meeting heard featured speakers, William S. Jack, former president of Jack & Heintz, second from left, and Art Scaife, advertising manager of G-E's appliance department, Bridgeport, Conn., third from left. Also at the head table, left, Secretary-Treasurer Clark Chamberlain, right, T. J. McIntyre, Yorkville Paper Co., and second from right, Archie Marsden, G-E Appliance Co. Old-timers among San Diego dealers (in picture at right), Lou Weise, Win Kinmore, Jerry Heilbron and Al Reynolds, participated in a dealer forum at the sales conference, brought the dealers' slant to many current sales problems

SELLING HAS THE SPOTLIGHT

At San Diego Winter Sales Conference

THAT old bogey, the buyers' market, took a beating in San Diego on Jan. 29. Instead of chanting the postwar appliance dirge, "the buyers' market—you can have it, I don't want it, it's too much for me," 500 members and guests of the Bureau of Radio & Electrical Appliances of San Diego County sat down to a concentrated program on how to sell more appliances, where to sell them, and how to make money in the business.

At a Winter Sales Conference that seemed to last no longer than it takes to read the bureau's full name, 52 speakers took to the rostrum to analyze the appliance market and to discuss ways of selling it profitably. As usual, San Diego drew top-name speakers from everywhere in the country. From the East came Arthur J. Scaife, advertising manager of the General Electric Co.'s appliance division, Bridgeport, with a discussion of appliance buyers as predictable people; from the mid-West came Ed N. Hurley, chairman of the board of Thor Corp., Chicago, who directed the dealers' and distributors' attention to the "appliance user" as the biggest and easiest to sell; Howard J. Emerson, Pacific Coast associate editor, *Electrical Merchandising*, San Francisco, analyzed this replacement market, showing its size and importance to the dealer; and to show from whence the appliances would come for all this selling, Carl Wittenberg, division manager of Columbia Steel Corp., presented a report on *Steel for Appliances in 1948*.

Ed N. Hurley, chairman of the board, Thor Corp., Chicago., told San Diego dealers and distributors to get interested again in the "users" of domestic appliances, to sell them again and to sell their friends and neighbors also

Further analysis of where and how to sell came from M. A. Hoff, kitchen specialist of Hotpoint Inc., who emphasized the importance of planning in selling electric kitchens; a preview of expected developments in the television industry in southern California during 1948, as seen by Klaus Landsberg, West Coast director of Television Productions (Paramount); problems the freezer industry must overcome to find its full potential, from Jean Miller, county farm administrator; the need for maintaining business ethics in a competitive period, by William S. Jack, former president of Jack & Heintz, Cleveland; probable trends in term selling, a banker's viewpoint from Anderson Borthwick of First National Bank of San Diego.

In brief paragraphs the significant manufacturer news was reported in last month's ELECTRICAL WEST Sales Guide News Letter.

San Diego's mayor, the Hon. Harley E. Knox, officially opened the conference at the noon luncheon.

Howard J. Emerson, associate editor of *Electrical Merchandising*, speaking at the noon meeting declared that the replacement market would be the most important subject to engage the electrical trade in 1948. "This replacement

market must be developed fully to create the large potential necessary to maintain the prosperity of our industry," he said.

At the afternoon session Hotpoint's kitchen specialist, M. A. Hoff, said that the dishwasher and disposal units are the most important units to get into the postwar kitchen. From these basic units a complete new kitchen can be sold. Essential to kitchen selling is the dealer's ability to plan the new or remodeled kitchen, he pointed out.

Commercial freezing methods, food distribution and transportation, and methods of defrosting foods are some of the problems facing the frozen foods industry now during its initial stages of development, said Jean Miller of the San Diego County Farm Administration.

Official greetings at the evening banquet were extended by De Graff Austin, chairman of the board of supervisors of San Diego County.

Klaus Landsberg, reporting on television at the evening meeting, declared that the dealer must sell himself on television before he can sell the public. He will have a good chance to do that during the next two years because, he said, there will be more transmitters, better pictures, and better programming.

In the related field FM, speaker Jack Gross, manager of San Diego's KFMB-FM, discussed the improvements being made in programming special programs for FM.

Several members of the San Diego Gas & Electric Co. and members of the bureau committees told the gathering of the efforts being made by the utility and bureau to promote the use of electricity throughout the country. A. E. Holloway, vice-president of the utility, disclosed his company's plans for cooperative effort in promoting electric usage.

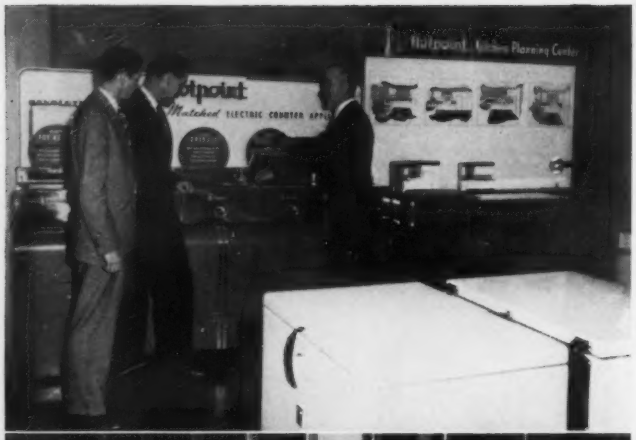
The bureau's advertising plans for this year were outlined by Taylor Brown, bureau advertising chairman, and F. M. Raymond, the utility's advertising manager.

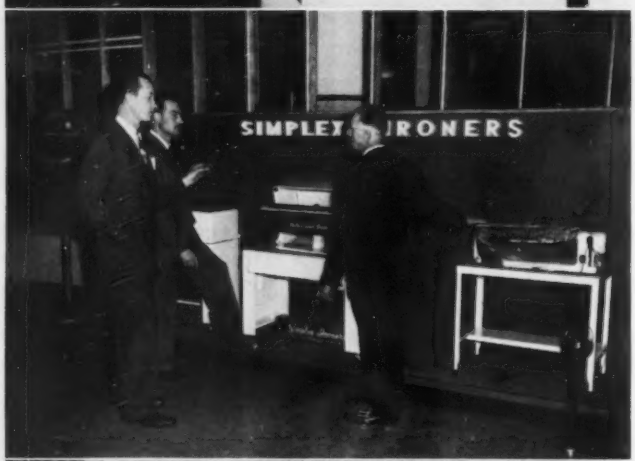
As an addition to the program, J. Clark Chamberlain announced the first of a series of dealer panel discussions. The four appliance retailers participating in the discussion of current dealer problems were Lou Weise, Al Reynolds, Jerry Heilbron, and E. W. Kinmore.

Heading the conference was O. G. Thompson, president of the bureau, assisted by Secretary-Manager J. Clark Chamberlain. Chairman of the program committee was R. E. Swearengin, assisted by Taylor Brown, Harry E. Gallaway, Gordon Dawson, Sam Hall, Archie Marsden, and E. W. Weise.

Seeing an opportunity to locate a store right next to the Idaho Power Co. office in Nampa, Idaho, B. F. Hoppins, last year, made careful plans and fitted them to his appliance, fixture, repair service and wiring business. B. F. Hoppins Electric Co. is at 210 11th Ave. So., in a 7,344-sq-ft. building, of which it uses 6,000 sq. ft. itself for merchandise display, with a garage and service shop accessible to it but separate from it through the door shown at the rear center, above. To dramatize the grand opening a 7-cu.-ft. Westinghouse refrigerator was given away. Numbered registration cards were filled in by each adult visiting. The card required name and address and a list of appliances the signer was interested in, to make a prospect list. Several ads were run to announce the first shipments of new Westinghouse water heaters. Crowds visited during the opening and business has been lively ever since. Owning the business with him is Mrs. Grace Hoppins. W. H. Arensberg is appliance sales manager. William Braden handles radio repairs; Howard Tarpom the wiring. The firm has handled electrical service for Pacific Fruit Express for 20 years

Some of the many winners of the Bendix sales contest trip to Hawaii are pictured here being greeted by the colorful Hawaiian entertainers as they alighted from the plane. Up the gangway are Freeman Burchette, Reno; Mrs. Mildred Morey, San Carlos, Calif.; Mr. and Mrs Lawrence Lovier, Oakland; Mr. and Mrs. Wallace Blight, San Carlos. On the ground, not including the entertainers, are Henry Terhayden, Eureka; Robert Welch, Oakland; Mr. and Mrs. Syd Losher, Modesto; Mr. and Mrs. Ray Lewsander, San Francisco; Mr. and Mrs. Robert Holding, Fresno; Mr. and Mrs. George Schleuter, Berkeley. The trip was a prize for exceptional sales of Bendix home laundry equipment in L. J. Meyberg territory





WINTER MARKET

Brings out new lines and record crowds

SAN Francisco's Winter Market Week at the Western Merchandise Mart can be summed up as a successful one. Attention was focused on new products, quality merchandise. Buying was satisfactory. Crowds were good.

In the appliance field, manufacturers were alert to the fact that greater sales promotions will be the big factor in moving available goods. Dealers learned the need for improved salesmanship.

Climax of Market Week for appliance retailers was the Western Radio and Appliance Trade Dinner held at the Mart Club on Feb. 4. Guest Speaker William I. Buchanan, San Francisco, regional manager of Frigidaire Division, General Motors Corp., told more than a thousand dealers and industry guests that "*salesmanship* is the bridge between a sellers' and a buyers' market."

We in the direct sales forces have not yet placed ourselves in the position to meet a buyers' market, he said.

"Although retailers have made great strides in the physical appearances of their stores, they have not geared their sales organizations to the point where salesmen *sell*."

Buchanan amplified this statement by explaining that the war and subsequent short supply years since the war have been detrimental to the art of salesmanship.

"There are men in sales positions today who never sold anything—they have merely been taking orders. Their sales ability has never been tested," he said.

It is up to the retailer to examine his selling techniques —to take inventory of the manpower ingredient, he added.

"Only when the salesman sells what the customer didn't know he wanted, is he a salesman," declared Buchanan.

Now is the time to build sales organizations because, he said, we are approaching an adjustment period which will determine "the survival of the fittest."

Radio and television outlook was reviewed by Clifford J. Hunt, sales manager of Stromberg-Carlson Co., Rochester, N. Y. The radio-phonograph television combination will be the unit sale item, he declared.

"Both FM and television present an opportunity for a great deal of profitable business, according to Hunt.

He recommended that the retailer make plans to do his own television installation and service.

Educating the public on what they have bought, what they can expect and what they can't expect, are important factors in selling. "This means a trained sales organization," said Hunt.

Pictured in Market displays (from top): Electric cooking equipment by Hotpoint was demonstrated by Oak Adams, right, of Graybar to Dealers E. H. Hotaling, left, and Bill Sheehan, center, of Allied Appliances, Richmond, Calif. Modern headquarters of McCormack & Co. displayed the new Simplex ironer; George W. Baack, left, and Al Cipparrone, center, of Record Merchandising Co. hear all about it from O. N. Rothlin. The "30-minute dryer" manufactured by Sky Products in Seattle is worn by Mary Paris; turban is made of taffeta; Clifford Anderson, right, shows Vernon Weill of Weill Hardware, Richmond, Calif., how the product is packaged. Fowler's two water heater models are shown by Fred Fowler, left; F. B. Posthuma examines table-top model; at left is 5-gal. Jiffy model

Hunt

Buchanan

Fenton

General chairman for the semi-annual trade dinner was F. S. Fenton Jr., San Francisco, divisional sales manager for The Easy Washing Machine Co.

A partial list of new products seen at the Winter Market were noted in last month's ELECTRICAL WEST Sales Guide News Letter. Other attention getters were apparent throughout the week. For instance—

Northern Electric Co. has a new electric blanket with automatic control; blanket weighs five pounds; is approved by Underwriters' Laboratories.

The Tri-Ocean Trading Co. in San Francisco introduced its Healthmaster Steamette — handy cabinet for taking steam baths. The Healthmaster weighs 16 lb., is portable and collapsible. Retails at $175, and is made in Van Nuys, Calif.

Deliveries on the Apex Fold-A-Matic ironer are expected by the end of March. Automatic washers will be later, says H. D. Rice, Los Angeles district sales manager for Apex.

Monitor had new things to display, among them a disposal unit.

General Electric Supply gave its model electric kitchen a louverall ceiling lighting; also showed its tootsie warmer, first cousin to its electric blanket.

Crosley distributors, the California Electric Supply Co., offered suggestions to help dealers sell. Nick Dinkle, Western regional manager of Crosley, was on hand to talk about the company's 3½-cu.-ft. Frostmaster display.

One of the remodeled appliance displays was Bersted Mfg. Co.'s display of traffic appliances highlighted in glass shelves.

Hotpoint's electric restaurant cooking equipment shown in its expanded space, attracted much attention from dealers. So did ideas on selling complete kitchens.

Television caught the eye of dealers at Kaemper-Barrett's display of the new Admiral matched unit. Jim Barrett of Kaemper-Barrett proudly displayed the unit.

Sky Products, Seattle manufacturer, presented a demonstration of its clever "30-minute dryer."

The Blackstone washer and dryer were displayed and demonstrated by its new distributor, Schlendorf-Kirchner & Co.

Only ironer demonstration, and tops too, was Ironrite's.

Besides its dishwasher, Kaiser had on display a new disposal unit.

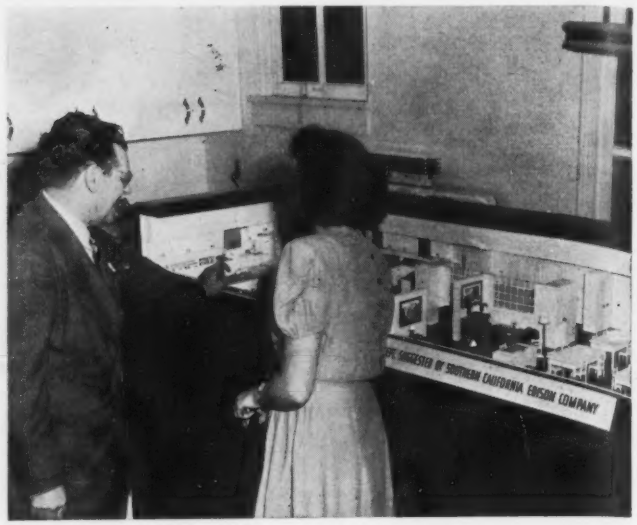
Comments from buyers on kitchen displays were that they were dusty—kitchens couldn't be shown off to good advantage.

Such are the brief sketches of the Winter Market. Attendance, according to the Mart reports, was one-third higher than the last Winter Market.

J. Vernon Sharp waited a long time to be able to expand into the space occupied by a furniture store next door, but patience was rewarded and now the attractive place looks like this below. Sharp Electric has occupied its corner spot at 128 S. State St., Salt Lake City, since 1934. As the fixture, wiring, lighting and appliance business grew and grew, the small store was crowded. Storage space was obtained across the alley. Arrangements were made to remove part of a partition and expand into the store next door for the appliance department, shown at the right

If Girls Dislike Home

Perhaps it is because schools do not teach homemaking with appealing new electrical appliances



Lloyd Bowles explains to a visiting teacher features of the model homemaking department suggested by Edison Co.

FOR more than a decade state and national directors of homemaking education have recommended to school administrators that the present domestic science rooms or laboratories be modernized if they are to prepare girls for living and to assume the responsibilities of home and family life.

This offers an opportunity and challenge to the electrical industry that the most modern electrical equipment be installed. These future homemakers should become thoroughly acquainted with all the advantages to be found in electrical living. Indeed unless they do so they can hardly be blamed for lack of interest in homemaking with its consequences of social and economic importance to the community.

In order to discover the status of domestic science rooms in the schools in its territory, and to determine if possible the effect of antiquated equipment upon the attitude of girls towards homemaking, the Southern California Edison Co. assigned Lloyd Bowles as school counselor to survey the situation. With the aid of the home economists of the company and with the full cooperation of the schools in the territory served by that utility, the unhappy facts about the problem were soon learned.

It was found, for instance, that the original conception of a domestic science room was to make it as much like a laboratory as possible, rather than to arrange it with some semblance to a home so that cooking could be taught on a family unit basis. While some of more recent school houses contained actual gas or electric ranges, of old models now, many were so much a laboratory that only gas plates or jets were provided at working benches.

Others were combination food and clothing rooms. Most schools require students to take one semester of foods and one semester of clothing, usually in their first year of junior high school. Afterwards it is an elective course. Not many students elected to come back.

The subjects recommended by the State Department of Education to be taught in a homemaking class are the following:

Foods: selection, meal planning, nutrition, buying, preparation, serving, preservation and storage.

Health: conservation, hygiene, home nursing.

Home management: safety, planning of furnishings, housekeeping, furniture arrangement.

Clothing: selection, designing, construction, care, preparation, buying and grooming.

Management of time: labor, income, money, goods and service.

Relations: personal, family and community.

House hospitality and friendliness in the home.

Care of children.

With such a curriculum a laboratory obviously is not appropriate. Many of the rooms were cheerless and lacked any home-like touch.

This was not the fault of the school administrators or domestic science teachers but was a holdover from a past decade or two when the original homemaking rooms were established on a different theory.

In schools that had electric ranges and kept them in first-class operating condition there was still needed the accompanying electrical appliances of today which make the kitchen of the home a joy to work in and to own.

A little mathematics as to the effect of such teaching is interesting. The typical foods room is set up for 32 students in each class, four girls to each range. With five classes a day that makes 160. Two semesters each year total about 320 girls and in 20 years that totals 6,400 potential homemakers who, from their experience with these ranges, either know and like electric ranges and the advantages to be found in cooking the modern electric way, or who know nothing about them and have to be shown and taught after they are married.

In many of the older schools only gas ranges are installed and the student has no opportunity to learn about electric cooking.

The magazine *School Executive* of February 1946 has this to say about education for family living as a responsibility of the school:

"If the program of home economics instruction were expanded to enroll a much larger percentage of those in the secondary schools than now take the work, not all the cost of expansion would have to be met from new funds. An increase in the offerings in home economics would not add to the total number of courses or teachers in most cases; but instead there would be a corresponding decrease in the offerings and staff for some of the academic subjects. A trend already apparent would be accelerated, namely, a decrease in the percentage of students taking subjects such as foreign languages and mathematics.

"If one accepts the premise that the content of homemaking education should be regarded as basic for all children and should perhaps be substituted for some of the traditional academic content which has little functional value for a large number of pupils now attending the secondary schools, the conclusion is inevitable that there is need for a greatly expanded program of homemaking education."

As a result of its survey the Edison Co. came to the conclusion that installation of new electric ranges was only a small part in the modernization of homemaking departments. Therefore it prepared and has offered to school authorities a planning service for remodeling of domestic science rooms into homemaking rooms, incorporating as many suggestions from state, county and homemaking teachers as the space would allow. Bowles makes a contact with the school people, gets the dimensions and requirements for the remodeling of homemaking class-

Typical home economics classroom. Gas burners were supplemented by three old-time gas ranges but there was no way to teach electric cooking. The laboratory atmosphere was carried to the limit in this room at Chaffee (right)

rooms and the data are turned over to Miss Claire Helwege, a kitchen designer for the Edison Co. She has made up plans for remodeling a large number of such classrooms. These plans have had very favorable acceptance. They provide adequate equipment and facilities for teaching all phases of homemaking. With each plan are shown several perspectives of details of parts of the room. A teacher's demonstration unit is usually incorporated which also includes an electric sink and automatic home laundry equipment.

When the plan is approved, the school administrator is given a confidential price list of equipment available to schools at special prices when used for educational purposes on school premises. Each manufacturer's, distributor's or dealer's offer is listed separately and mention is made that the Edison Co. does not sell the equipment but offers its services to assist the school in the selection and purchase of equipment.

Typical is a case of The Highland School which started out to purchase one electric range, one electric refrigerator and a steel base cabinet. Suggestions and a plan were made by the Edison designer for remodeling. These were accepted and orders were placed with various distributors and dealers for the following equipment:

Special schoolroom furniture $2,720.50.

Four steel kitchen sinks and cabinets $1,099.77.

The following appliances: one electric sink, one additional electric range, one roaster and grill, one electric water heater, one automatic clothes washer, one electric clothes dryer, a steam iron, a mixer, a waffle baker, an automatic toaster, an automatic coffee maker.

Nor has the Edison designer omitted including gas equipment. Modern gas ranges are included in all of the plans, believing it is as unfair to the student to have instruction on electric only, as it is to be limited to gas equipment.

To the state of California's model

Miss Clesta Meyers, left, Westinghouse Supply home economist, demonstrates equipment at the initial meeting

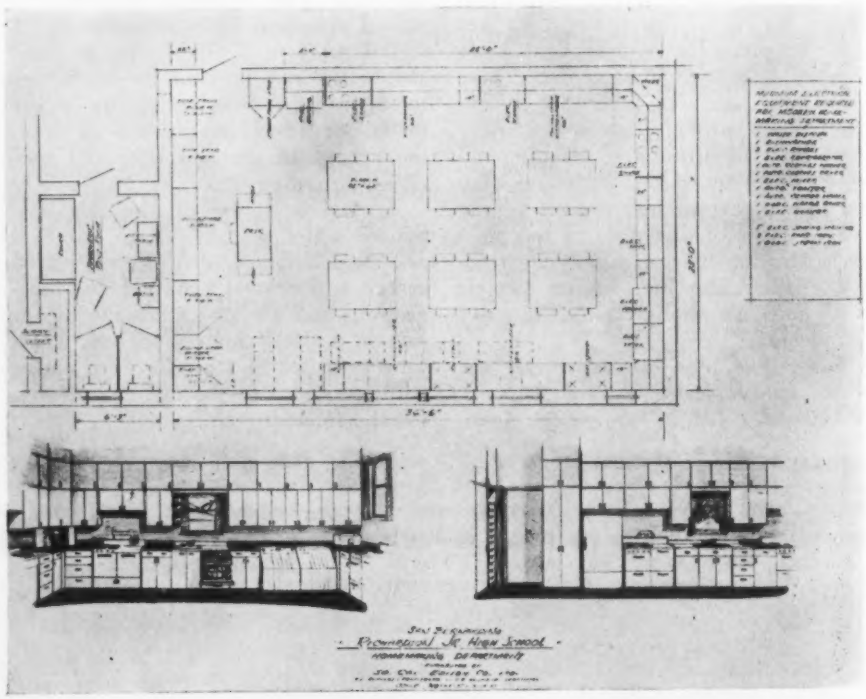
Miss Geri Furst, right, Hotpoint home economist, demonstrates company's equipment in remodeled schoolroom

Left, homemaking room of Richardson Junior High School in May 1947, before it was remodeled. Cooking was taught on gas plates at left; sewing at large table on right. Equipped with modern electric kitchen and cooking centers with modern ranges and equipment, right, the room looked like this. Sewing is done in the foreground

plan for such classrooms was added a complete teacher's unit with an electric sink, automatic washer, an electric clothes dryer, and many other conveniences for both teacher and pupil. This plan for a modern homemaking department met with such wide acceptance that the company decided to make a scale model to show at the California Home Economists Convention at the Huntington Hotel last year. It was seen there by more than 600 home economists and has been displayed on several other occasions to groups of school officials and home economists. The model plan includes a food preparation room at one end and a clothes and fabric classroom at the other separated by home-like living and dining rooms.

The kitchen is arranged in unit kitchens, each with an individual sink and range in which a small group of girls can work. The teachers unit along the wall contains a complete electric kitchen with the automatic laundry equipment, which is used to wash the towels and linens and the electric sink washes the dishes used in the class. Modern sewing machines are provided in the clothing classroom as well as ironing equipment, etc.

When the Richardson Junior High School in San Bernardino was remodeled, a preview and demonstration was held for the school board and members of the faculty of the San Bernardino County schools. Dinner was served in the school cafeteria and afterwards the Hotpoint electrical equipment was presented by Miss Geri Furst and the Westinghouse equipment by Miss Clesta Meyers. Lloyd Bowles, the



Plan for Richardson homemaking department, as prepared by Edison designer

Edison school counselor, at the model homemaking department display, set up and explained the operations of a complete homemaking department.

The remodeling of this department in the Richardson Junior High School and this presentation were received with such enthusiasm that the Edison Co. has now been requested by the school board to make the layouts and draw up specifications for all the other schools in the area. There were about 45 teachers, heads of departments and school board members present at this meeting.

What this means to the community is a reawakened interest on the part of junior high school and high school girls in homemaking. The social consequence of this can well be imagined.

What it means to the electrical industry is that a larger number of girls of high school age will have had expert training and experience in the use of modern electrical home equipment and will want to make such equipment a part of their own home plans.

For the country at large it means advancement of the American standard of living.

ELECTRICAL WEST

Sales Guide

FOR THE ELECTRICAL MERCHANT OF THE WEST © MARCH, 1948

HOW TO SELL IT

As told to the Inland Empire Electrical Dealers Assn. by Harry Chisholm, Jr., manager, Bekins Moving & Storage Co., Spokane, and condensed from his talk by R. L. Wilkenson, IEEDA manager.

THERE is no fixed formula for salesmanship that I know of, and I doubt if any one else has one either. There are four pegs on which selling is supported, however. These are **work, study, enthusiasm** and the **ability and courage to close sales.**

Every salesman must **work** hard. He must put in full hours without loafing if he expects to be successful in this highly competitive profession.

Every salesman must **study** continually. He must study his own products. He must know his competitors' products. He should read trade magazines, association publications, all of the material available on salesmanship. He should know some psychology. He should take public speaking. He should know some of the rules about "How to win friends and influence people."

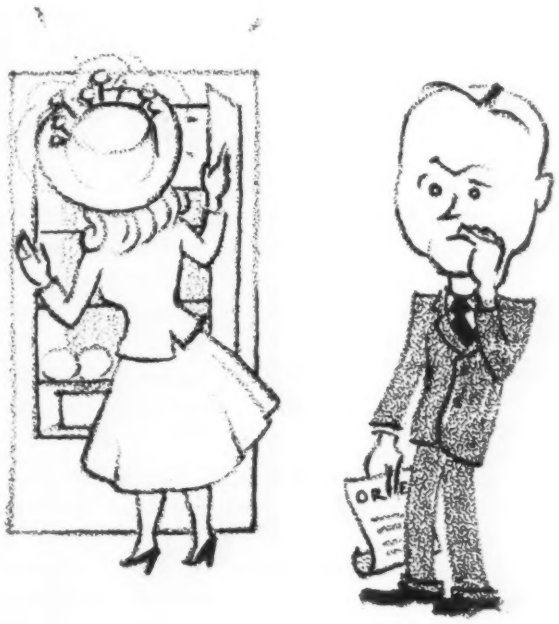
Enthusiasm is an elusive quality. It is of great importance to the salesman. It is a contagious thing. The salesman who is enthusiastic about his merchandise and can show his enthusiasm will find his prospect helping him to sell him. But if a salesman loses confidence in himself or in his product, he will lose his enthusiasm.

Some salesmen can work hard, know all there is to know about the product, know all the rules of salesmanship and be enthusiastic, but if they do not have the **courage,** intelligence or **ability to close sales,** they cannot be successful salesmen.

The good salesman must be able to weigh the selling features of his product against the objections raised by the prospect and when the sale is tipped to his advantage, get the order blank signed. Every merchant wants salesmen who are not afraid of the order blank.

It is good to keep in practice writing orders and closing sales and doing it frequently, even though a number of blanks may have to be filled out before the customer is actually ready to sign.

Do not let a prospect, no matter how "cold" he seems, get away without asking him at least once to buy. Whether it results in a sale or not, it is good practice.



As we come more and more into a buyers market there is more and more need to sell every appliance. Selling must be relearned.

Be Financially Successful by your

SERVICE POLICY

Seventh of a series by

KEN HAMPTON

REGARDLESS of who does the actual work of repairing, poor service on electrical appliance repairing hurts both the reputation of the manufacturer of the product and the reputation of the retailer who sold it, as well as that of the repair shop.

Survey after survey has indicated that too many customers are being gypped by poor repair work on radios and household appliances. In fact, it is reliably reported that Better Business Bureaus in several cities are getting ready to swing into action to expose shops doing unreliable work or overcharging for work performed.

When a line of appliances gets a reputation for "high cost of upkeep," sales suffer and promotion costs increase. Thus, poor workmanship or unfair charges become the direct concern of both the manufacturer and the dealer.

Along with the problem of adequate fair priced repair service for his customers' products, the retailer has lately found himself facing complaints from customers on poor assembly and installation in the home. These generally arise when installation work is subcontracted to another firm.

Customer complaints here arise both from unfair high charges for installation work performed and missing parts or inadequate instruction being given on proper use of controls or parts. Complaints also indicate that the installed appliance or the surrounding area is left in a sloppy condition by the installer.

Because of these conditions, many dealers who have been subcontracting their installation work are beginning to set up their own installation departments.

It would be very wise for every retail dealer to make a personal inspection of several new installations in customers' homes while they are being made or immediately thereafter. In this way, he can gain first-hand information on the efficiency of his delivery and installation service and find out from his customers if they are pleased by it.

Peculiarly, poor workmanship goes hand in hand with excessive costs for delivery and installation service. Poor installations sooner or later lead to the customer demanding additional service attention. In this connection, some electric utilities are already becoming concerned by the additional load that is being thrown on their repair department by poor installation of appliances. This is particularly true where the utility undertakes to do all the repair work on electric ranges and water heaters installed on their lines.

The customer who believes he has been overcharged for repair work is quick to believe that the price on all products and services of that retailer are high. The customer who is displeased over an installation job is inclined to be critical of all actions of that firm. Too much customer goodwill that has been carefully nurtured by the proper display and advertising and sales promotion of electrical appliances is being lost by poor installation and repair service.

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ELECTRICAL WEST

Sales Guide

News Letter

FOR THE ELECTRICAL MERCHANT OF THE WEST

March 1948

While the East unburied itself from snow California's weather overdid it in reverse to such an extent that there is hardly any water to turn power house water wheels. Farmers turned on their pumps, used only in summer normally, and threw an abnormal electric demand on top of a curtailed supply. The situation developed so fast PG and E had no time to warn all its million customers. To save water, generators were run slow. This made all electric clocks late. Now the Public Utility Commission, to save precious water, has ordered a 10% reduction in all electric usage. This bounced on dealer sales immediately. Electric clock sales stopped. Range sales too, as well as water heaters. Gas appliance people were jubilant.

Caught with its frequency down

Because, when companies exchange power or sell to each other, all frequency must synchronize, this affected California Oregon and Sierra Pacific territory as well as all municipals and power purchasing utilities in Northern California. New steam plant additions in summer and fall will provide more power but unless March brings lots of rain and snow it may be a dry year for sales as well as agriculture in the affected area.

Why it reaches Oregon & Nevada

Angle to dealers selling electric clocks--Let the public know the electric clock is still the most reliable time piece, the situation is temporary, and that it takes less time to advance an electric clock a few minutes a day than it does to wind a spring clock. Keep selling 'em.

Clock angle

Which also brings to focus that real selling will test the staying ability of all dealers in this affected area. They will have to sell against this big obstacle--selling the idea of buying now while available and being patient til the situation eases. New houses having no other fuel for cooking, can still be sold electric.

Makes selling necessary

Northwest and Mountain regions, crying for more ranges, may find some diverted to them as a result. This will bring the need for selling right back into those regions too as pipelines fill up. Next few months will be the endurance test on dealerships. Those who can really sell will survive.

Last mile

When the Public Utility Commission of Washington state turned down Puget Sound Power & Light in its request for the same upturn electric heating rate Seattle City Light had passed by ordinance last year, the electric heating dealers, manufacturers and engineers quit negotiation and started circulating petitions for an initiative measure to vote a new lower rate. The new rate would provide for all kwh over 500 at 7 mils.

Take to voters

According to NERA a couple of radio manufacturers have announced an increase in dealer discount to support year 'round selling effort.

Up the discount

Dates have been set for the next big conference of the San Diego Bureau of Radio and Electrical Appliances and its annual electric and home appliance exposition. The summer conference will be July 15. The show, earlier than previously, on Sept. 14-19.

San Diego dates

Youngstown Kitchens have a clever new selling gadget for the disposal that it has just brought out. It is a wheeled caddy cart by which the disposal can be wheeled into a home, connected with hoses to the sink, plugged into an outlet and actually demonstrated. Washers were introduced by home demonstration. Perhaps this will be the key to disposal sales.

Free wheeling

George Gillespie, district manager of General Mills home appliance department, corrects last months item about the fire that held up deliveries of its new steam iron attachment of its Tru-Heat iron. All the stock made and ready for delivery was lost in the fire but the facilities to make them were not and May 20 is the date they will be put on sale. The fire set them back 60 days.

Out of the fire

Ray Flint, who has been managing Northern California Electrical Bureau, San Francisco, leaves Mar. 1, to join Tay-Holbrook Co., heating and ventilating company, at its Oakland office. Prior to NCEB Flint was with Russell & Co. selling electric air heating.

Change

Ceazan & Co. has been showing the extraordinary action of the Cinderella Electric Clothes Washer, a baby sized washer for apartments and small homes, taking 2 lb. of clothes, using 3 3/4 gal. of water and washing by a vacuum action instead of an agitator. Originally made by Black & Decker, electric tool manufacturers, it is now independently made.

Strong Baby

Meier-Murphy Co., San Francisco, will handle the laundri-vent fan in California, Nevada, Utah, southern Idaho and Arizona. The full-duty fan, manufactured by the Broan Mfg. Co., is used in homes and commercial applications to remove humidity when clothes driers are used.

Another line

H. Bennett McDonald is the new Western district manager for electrical appliance sales of Yale & Towne Mfg. Co. His territory includes Washington, Oregon, California, Nevada and Arizona.

Coast appointment

Seattle's big Home Show and Household Fair is due to open at Field Artillery Armory March 27-Apr. 4, sponsored by the Post Intelligencer and Seattle Master Builders. The Association of Appliance Dealers is cooperating with and assisting the show. Distributors exhibition will be assisted by dealers in manning their booths. Dealers will also supply door prizes. Grand prize is an all-electric kitchen. Two "dealer days," Monday, Mar. 29 and Thursday, Apr. 1, will give them a preview of exhibits before opening to the public at 2 p.m.

Seattle Home Show

Presteline has announced that Bandoli-McIntyre Co. has been named its distributor for southern California. Marvin Bandoli announced appointment of full time managers in the 11 counties served. Also announced discontinuance of distribution of 15 lines in order to concentrate more on Presteline ranges and water heaters and five other major appliance lines.

New policy

Wisdom

Speakers at the Spokane first quarterly meeting of the Inland Empire Electrical Dealers Assn., on the first or "What to sell" part of the program had good advice for any dealer anywhere:

What men think

E. A. Pugsley, F. B. Connelly Co., said dishwashers are not just luxury items, as thought in the past. There is a growing market for them. They are important labor saving devices to make life easier for the housewife. Nearly half the dishwashers are bought by men. Shows what men think about helping with the dishes.

Associate

"Get out of the swivel chair, get on your feet and sell," is what is needed now, said Gordon Souther, International Harvester Co. Support your association to a maximum, he advised. A retailers organization is the dealers salvation in difficult times.

Plenty of market

Frank Hirte, Marshall-Wells Co., pointing to tremendous increases in appliance sales in 1947 over 1941 said it proved the extensiveness of the market. 114 out of each 1,000 families will buy refrigerators; 200 out of every 1,000 will buy radios; 47 per thousand will buy vacuum cleaners. Other appliances enjoy equivalent demand.

Live display

Home freezers bring real savings to the home, said Robert Guertin, Prudential Distributors, Inc. Told the importance of stocking display freezers with food that can be frozen successfully because few salesmen can dramatize the bare interior of a box. Selling freezers is like selling pianos, said he. Piano salesmen long ago learned the importance of getting a piano in the prospect's home to learn its value from actual use. Suggested considering some way to rent small home freezers for trial.

Freezers hot

J. B. Kelly, Standard Sales Co. also pitched on freezers. Said there is a larger potential market than for other major appliances and no trade-in problem yet. Appealed to dealers to promote and merchandise freezers intelligently and aggressively; not assume the market is poor and stock none and attempt no sales.

Sell service

Sell real service again, W. H. Shafer, Sunset Electric Co., Seattle, told the conference. He predicted big changes in merchandising methods in 1948. Real service, including good demonstration, installation, instruction in use and follow up to check customer satisfaction is the independent dealer's stock in trade.

Know competitors

C. A. Tubbs, Tubbs Electric Co., told dealers that they should know their competitors. His observation was that competitors in small towns who are well acquainted and friendly are all highly successful. Successful dealers do not try to hurt their competitors. They get further by knowing them well and cooperating with them.

New tone

Sylvania has added a new fluorescent lamp to its line--calls it "Warm-tone." Useful in both commercial and residential fields. Lamp is close in color match to the incandescent lamp. Has proved to be the answer to color correction problems in large eastern department stores. Macy's, for one, is pioneering the new lamp.

Taken to them

Dealers in Utah and that part of Idaho served by Utah Power & Light Co. are being taken a personal message of the sales promotion activities of that utility in a series of meetings, according to W. A. Huckins, sales manager. J. F. McAllister, residential and farm sales manager and members of the industry put on the program in each trading center.

Radio dealers in Portland got together to talk about FM. Sponsored by the Portland Council of Radio Distributors and conducted by radio station KPFM, purpose was to give dealers suggestions on how to explain to prospects why extra dollars should be spent to receive the benefits of FM. — FM forum

Million-dollar manufacturing contract has been signed by the George E. Swett Co. of San Francisco with Production Engineering Corp. of Berkeley for the manufacture of a water heater which can be used in radiant heating of homes. Will be called the Waterola. Production will get under way soon, says the Berkeley firm. — Coast make

Universal RC recording chasis is a new home recording unit being manufactured by Universal Microphone Co., Inglewood, Calif. Has a 10-inch turntable, with a 110-volt, 60 cycle, 78 RPM motor which can be converted to 50 cycle operations, and has a crystal pick-up to play back 12-inch records. Will sell at $59.50. — Home recorder

Alert Frigidaire dealer in Logan, Utah, by the name of Homer S. Lloyd, is "airing" his business these days. When customers need new equipment, parts or service, Lloyd, a licensed pilot, hops into his privately-owned plane, "drops down" on the customer, and takes care of his business in short order—particularly handy for emergency service in isolated installations. — Air business

In setting up Hotpoint's expanded marketing organization, Leonard C. Truesdell, vice-president of marketing, announced the new distribution division field organization. In the Pacific district Donald W. Rennewanz will be manager, with August H. Jaeger sales manager at Seattle, and Vincent E. Koch sales manager at Los Angeles. — Coast appointments

Western Appliance Corp., Kelvinator distributor for the Rocky Mountain area, is building a $250,000 appliance distribution center in Denver, says L. F. Skutt, president of Western Appliance. Plant will occupy a full city block. Will have separate display rooms for each type of appliance, an auditorium seating 100, a complete operating kitchen for demonstration purposes, and radiant heating and air-conditioned offices. Expects to be completed by this summer. — Plant under way

Rheem distributors and dealers are being offered a sound film on water heaters to be used in training of their salesmen. Film tells about sales possibilities in the field, how to meet prospects and explains the manufacture and structure of the Rheem water heater. — Film news

Preparing in advance for any heat wave, G-E's "early bird" fan campaign is on now and will run until March 31. In merchandising fans, B. M. Tassie, Pacific district manager of G-E's appliance department, says the dealer must be ready when the call comes or he misses his sale. Idea is to help dealers plan their summer fan promotion now. — Catch the worm

Universal is out to do something about training its distributors and dealers to know all about Universal products. With a series of eight films on sales training, Universal explains the essentials of merchandising, and stresses features of its major and traffic appliances. — Selling impetus

Hotpoint has an electric-educational program in operation now by which it is cooperating with local electric companies to rehabilitate school home economics departments. Company announced that accredited schools may procure electric appliances for home economics departments at approximately half their retail price with an arrangement to replace them annually at no extra cost. — For schools

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T-N-T EXPLODES ON YOUR SALES FLOOR!

New 2-way tests absolutely prove Bendix tops 3 leading non-automatic washers—in washability—in germ removal!

No vague statistics here—but actual, unretouched photographs definitely prove that the Bendix automatic Washer gets clothes cleaner—with less soap—with less hot water!

The Pittsburgh Testing Laboratory has completed soil removal and germ removal tests of a Bendix and *three leading non-automatic washers.*

The results are dynamite! The Bendix removed 23.3% more soil than the *best* of the three competing washers tested! The Bendix did more than 10 times as good a job of germ removal as the other three machines tested.

Study these results yourself! Then—get in touch with your Bendix distributor. Ask him how you can tie-in with this great new story.

Bendix Home Appliances, Inc., South Bend, Indiana.

LOOK AT THESE UNRETOUCHED PHOTOGRAPHS!

BEFORE

Bendix automatic Washer

BEFORE

Machine "A"

BEFORE

Machine "B"

BEFORE

Machine "C"

Each spot in each picture represents a germ colony.

AFTER

Bendix automatic Washer—Germs practically gone.

AFTER

Machine "A"

AFTER

Machine "B"

AFTER

Machine "C"

Note quantity of germs remaining. Compare with Bendix!

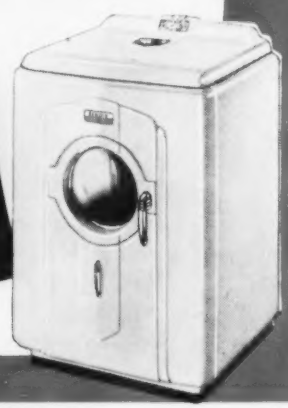
HOW THE TESTS WERE MADE:

The soil removal tests were made in accordance with the Test Manual of the American Washer and Ironer Manufacturers' Association, with water temperatures of 160° for the automatic machine and 125° for non-automatic type machines as specified by the Manual.

For the germ removal tests the washing procedure as above was supplemented by a pre-determined rinse procedure established from contact with authorities in the field of home laundering, including the manufacturers of the machines used. The Bendix was used in accordance with the manufacturer's published instructions. Staphylococcus aureus bacteria (bacteria commonly used for test purposes) were used to measure efficiency of germ removal.

The four washers used, three non-automatic and a Bendix automatic Washer, were purchased in the open market by the Pittsburgh Testing Laboratory.

BENDIX automatic Washer



What, How and Who

Inland Empire Electrical Dealers Assn. probes the prospects of selling a rich regional market

Three presidents of Inland Empire dealers—John F. Boothe, Spokane; W. Earl Snyder, Big Bend; R. W. Burch, Coeur d'Alene chapter presidents—look over results of IEEDA 5-minute opinion poll

WHAT to sell, how to sell, and who will buy it—in other words, "the works" was given to the Inland Empire Electrical Dealers Assn. in person at its first quarterly meetings of the year, beginning at Spokane, Feb. 11, and was brought to the Palouse and Lewiston chapters the following week, part live talent, part Peirce wire recorded. The theme was "Selling in 1948." The Big Bend and Coeur d'Alene chapters met jointly with the Spokane Chapter and approximately 165 dealers, contractors, distributors and utility people attended.

The three-part program dealt with important factors in selling in a buyers' market. For space reasons the first part, "What to Sell," will be reported in this issue's News Letter. It featured three-minute talks by E. A. Pusley, F. B. Connelly Co.; Gordon Souther, International Harvester Co.; Frank Hirte, Marshall-Wells Co.; Robert Guertin, Prudential Distributors Inc.; J. B. Kelly, Standard Sales Co.; W. H. Shafer, Sunset Electric Co., Seattle; C. A. Tubbs, Tubbs Electric Co.

Second part, "How to Sell It," is summarized concisely by Robert L. Wilkinson, IEEDA executive secretary, and appears in this issue's Sales Guide. It is condensed from a talk on salesmanship by Harry Chisholm Jr., manager, Bekins Moving & Storage Co., Spokane.

Third part, "Who Will Buy It," was an excellent review of the immediate market in the Spokane and Inland Empire area, presented by Frank A. Tool, Washington Water Power Co. and secretary of the Spokane Chapter, and by Wilkinson.

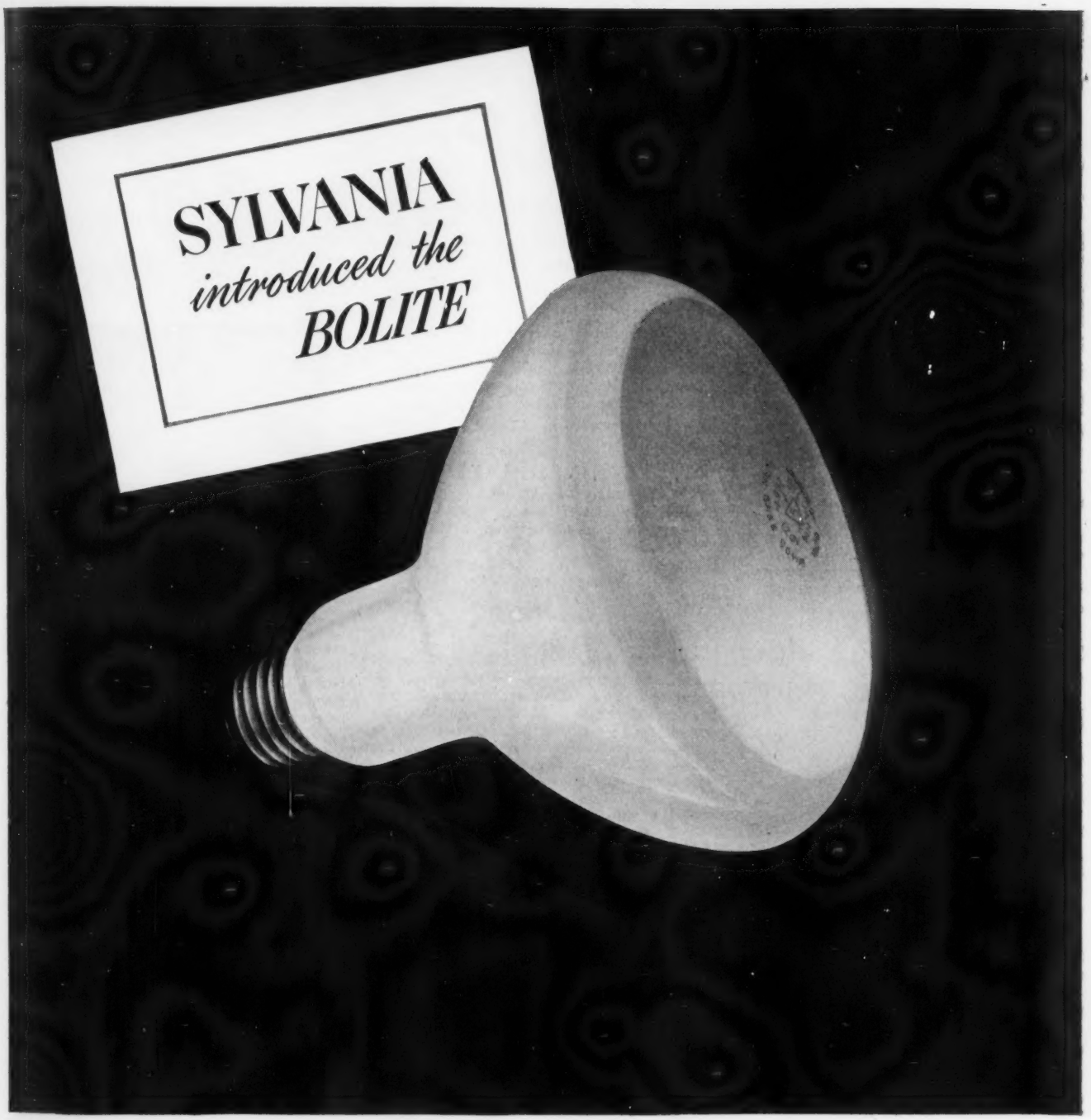
Manufacturers, in the face of great difficulties, produced in 1947 68% more irons, 39% more electric ranges, 107% more washers, 24% more radios and 436% more water heaters than prewar years, Tool said. Sales in the Inland Empire alone increased from 115,045 units to 169,598 and dollar volume in 1936 was $3,746,164, in 1947 $10,840,659. However, said Tool, 35% of the dollar volume increase is due to unit price increases. He gave range and water heater sales figures and said 1948 can and should be as good a year as 1947. Spokane has had a population increase of 40,000 since 1940, the empire has 16,000 more new homes than in 1945, a large number are being built, there is extensive home remodeling, a high marriage and birth rate and the area has one of the highest spendible income rates per capita in the U. S. Public acceptance is very high. But to sell the potential in a buyers' market will take planning, hard work, intelligent, aggressive selective and assiduous selling.

Wilkinson picked up the momentum and likened the situation to a wheel. As it turns, potential customers become purchasers, non-owners become potential customers, more non-owners are added as new homes are built and families increase and the age of appliances increases—all adding to the number needing replacement. Much of the last two year's sales will increase replacements in years ahead. Backed up demand is far from satisfied. Large numbers of families are doubled up.

In the Inland Empire, Wilkinson continued, 91% have radios, but 11,000 intend to replace them; 87% have washers but 18% of these intend to buy new; 82% have refrigerators and more than a third of the non-owners intend to buy them soon. Vacuum cleaners, thought to be highly saturated, are only owned by 64% of the region's families. Next to ranges and radio-phonographs this market has the most immediate prospects. Electric ranges are not yet owned by 45% of the region's families and of those in use 20,000 are more than ten years old. Ironers have the greatest average age of any appliance studied: 40% are more than ten years old; only 9% of the families own them.

John F. Boothe, Brown-Johnston Electric Co., president of Spokane Chapter, ran the meeting, with Earl Snyder, president of Big Bend and R. W. Burch of Coeur d'Alene Chapter beside him. At the Colfax meeting of Palouse Chapter, S. C. Haddock, Moscow dealer, presided. Chisholm, Tool and Wilkinson, and R. G. Morrison representing the Peirce wire recorder, presented the program at the Colfax and Lewiston meetings. Spokane directors, V. J. Morris, Kenneth Hughes, Frank Tool, Stanley Densow, Ed Falls Jr., J. Poulin and M. E. LaCounte, were introduced and W. J. Maghan, membership committee chairman, reported 40 new members since November, making a total of 250 IEEDA members.

Speakers table at Spokane three-chapter meeting. At left, Kenneth Hughes, Spokane treasurer; R. W. Burch, Coeur d'Alene president; V. J. Morris, Spokane vice-president; Harry Chisholm Jr., Bekins, guest speaker; John F. Boothe, Spokane president; Robert Wilkinson, executive secretary; F. A. Tool, Spokane secretary; Earl Snyder, Washtucna, Big Bend Chap. president



THE Bolite is a 200-watt standard base electric light bulb that gives both direct and indirect illumination. Sylvania research revealed a great need and demand for such a bulb—Sylvania engineers came up with the answer.

The Bolite is one of the many "firsts" introduced by Sylvania Electric, pioneers in the fields of Lighting, Radio, FM, Television and Electronics.

ALL PRODUCTS MADE BY SYLVANIA ELECTRIC CONSUME ENERGY — MORE THAN 10,400,000,000 KWH PER YEAR

SYLVANIA ELECTRIC

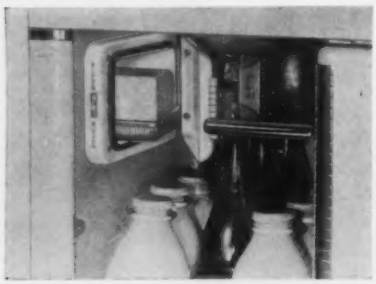
WEST COAST DIVISION OFFICES: LOS ANGELES, SAN FRANCISCO, SEATTLE

APPLIANCE PREVIEW

Food Mixer (342)

Universal has a new streamlined food mixer with extra large stainless steel beaters, two glass bowls (1 and 3 qt.), a juicer, beverage mixer and strainer. It comes in white enamel with black trim, has rubber feet, a radio interference eliminator and 6-ft. rubber-covered cord. Operates on a-c or d-c.

Butter Conditioner (343)



A butter conditioner is incorporated in the improved General Electric deluxe 8-ft. refrigerator, the NF-8. Built into the left wall of the box, the conditioner holds one pound of butter.

Water Heater (344)

Rheem Mfg. Co. is making an automatic table-top electric storage water heater with 30-gal. capacity. It is encased in a steel jacket, finished in white baked enamel; is recessed at the bottom to fit over baseboard and against the wall. The heating element is of nichrome imbedded in magnesium oxide and sealed in a seamless copper tube. Fibreglas insulation, finger-tip control dials on heads of thermostats, instant power shut-off at set temperature, are other features listed in the announcement.

Electric Sheet (345)

An electric sheet offered by Westinghouse is made of peach colored muslin 70x84 in., with heated area 54x70 in. Buttonholes around the outer hem allow for buttoning to top covering if desired. The new sheet is washable.

Accessory (346)

The Westinghouse Attach-Adapter is an accessory to simplify use of attachments on the company's automatic vacuum cleaner. It consists of a metal fixture that fits under the nozzle of the cleaner and saves stooping to make hose connections.

Refrigerator (347)

The 1948 Moist-Master Kelvinator Masterpiece has top-to-bottom refrigeration, refrigerated fruit freshener, across-the-top-frozen food chest, with 50-lb. capacity. Two sets of refrigerating coils are used, one to maintain sub-freezing temperature in the bottom food chest and refrigerate the central compartment, the other, operating at just above freezing, to refrigerate the glass-enclosed freshener and tilt-out fruit freshener.

Casserole (348)

G-E has a small electric casserole for quick "one-dish" meals. It has a 4-qt. capacity, is available in two models, one with automatic temperature control with range of 100° to 550°F. and one with a two-heat control.

Business Machine Lamp (349)

Mitchell's new fluorescent typewriter and business machine lamp, Model 1012, has a reflector that swings, tilts, extends in any direction. The steel base slips under any portable office machine and the entire unit may be moved easily. Uses one 8-watt fluorescent tube; has plug-in ballast, operates on 110-125 volts a-c.

Automatic Washer (350)

The 1948 Coronado automatic washer is a console-type, top-door unit with floating power, fluid drive, self-cleaning, vertical washer tub and sediment trap, geyser-action power rinse. This machine uses the agitator principle and is said to require 12 to 15 gal. of hot water per load. Controls are on the top rear of the console and may be set for automatic load handling or cycles may be stopped at any stage and repeated or resumed.

Desk Lamp (351)

Faries Mfg. Co. is offering the Circlarc desk lamp for use with the circlarc fluorescent tube. This lamp is 13 in. high, has 6x12-in. cast base, comes with turn-button switch and 10 ft. of rubber-covered cord, is finished in electroplated statuary bronze with gold trim or steel grey with gold trim.

Clock-Radio (352)

Garod Electronic Corp. is offering the Radalarm, clock-radio combination, in ivory plastic and lucite case. A built-in loop antenna gives reception over the 540 to 1,650 broadcast band. Clock is a Telechron.

ELECTRICAL WEST, 68 Post St., San Francisco 4, California
Please send me information about following CIRCLED items:

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Name..... Company*..... Title*.....

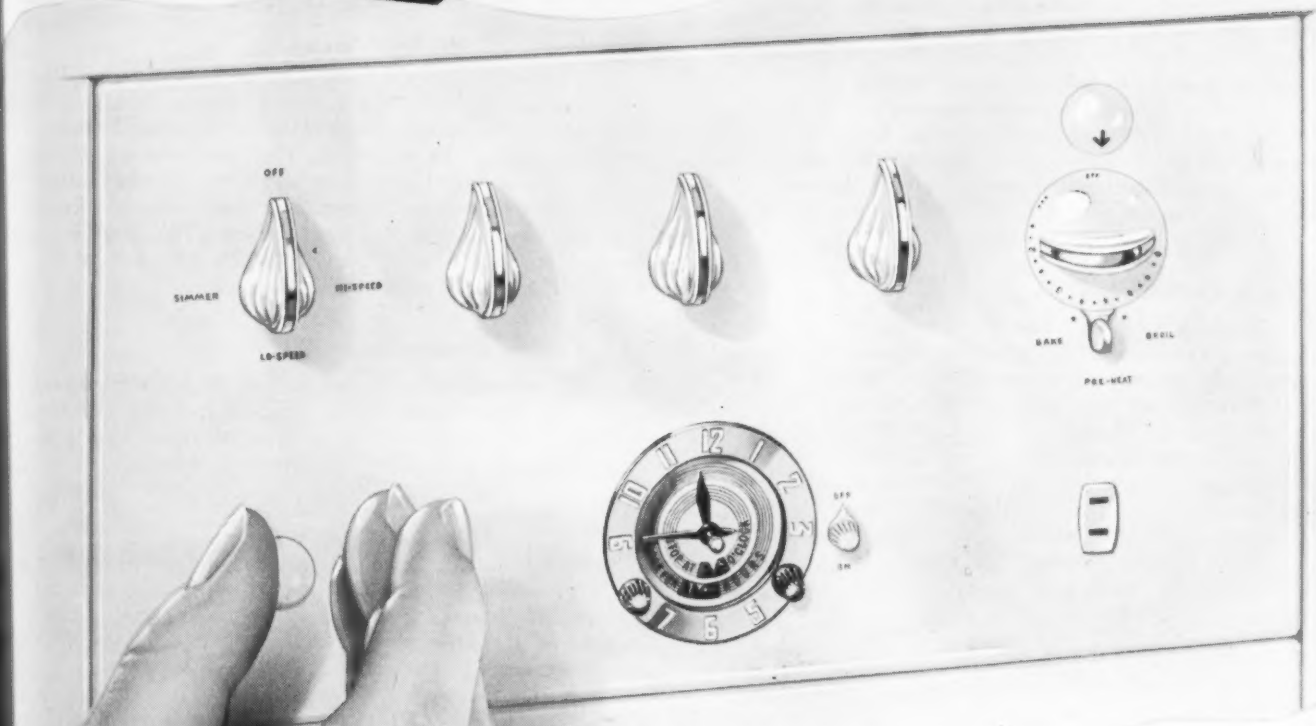
Address.....

* Please include your company's name and your position, as we cannot ask manufacturers to furnish literature unless you do.

THERE'S

Convenience

IN THIS COMPACT CONTROL PANEL



ALL AT THEIR FINGER TIPS! That is where experienced homemakers prefer to have the switches and controls on their electric ranges. Like this handy compact arrangement on a typical MONARCH — Model F56P shown above and also on the Famous 2 Oven Roaster Range Model F57P.

When you observe the obvious convenience and safety of this arrangement of operating panel, it is understandable why MONARCH dealers and Utility accounts find it a pleasure to offer these practical range designs to their customers. Here are features that are popular with service departments also. Let us send you complete information on MONARCH Electrics.

MALLEABLE IRON RANGE CO.

3938 Lake Street — Beaver Dam, Wisconsin

Monarch-Paramount

THE MONTH IN BRIEF

Drought Brings Brownout

Drought, accompanied by unseasonal and unprecedented irrigation pumping demand, brought a critical water shortage to northern and central California and induced a PUC power brownout order. The emergency order, affecting seven power companies serving the area, forces a 10% power cut on agricultural and industrial users, threatens shut-off for violations; asks residential customers to make the same reduction in use; allows frequency drop even below the 59½ cycles adopted by PG and E before the commission order; allows companies temporarily to halt or curtail service to commercial customers after a telephone warning; curtails sign, show window, sports and street lighting. Even with these measures and the estimated power savings through a daylight saving proposition before the state legislature, the brownout was not expected to be lifted before fall.

Situation Critical

Precipitation in Pacific Gas and Electric Co. territory had ranged as low as 21% of normal in some areas and snow pack is lowest on record. By running steam plants at full capacity last year, the company started 1948 with carry-over storage of about 50% of capacity, but pumping demands exceeding normal by 250,000 hp. made heavy inroads, resulted in frequency and voltage drops and a call for voluntary curtailment by users. Company officials estimated that the drought, plus rapid load growth, plus delay in delivery of generating equipment, would make the situation critical for the next nine months.

Other States Report Shortages

Elsewhere in the West, short water supply was damaging crops, threatening a tight power situation. California Oregon Power Co. was affected by curtailment of power deliveries from PG and E. and Mountain States Power Co. was asking industrial plants near Springfield to operate on staggered shifts, with a possible extension of the shift operation. Ground water supplies were dropping at such a rate in Arizona that a special session of the legislature was called to draft a ground water control law. New Mexico, although not up to normal, was better off than last year. Darkest spot in that state is Elephant Butte irrigation district, which announced cuts in irrigation water allowances; the district's hydro plant was put out of service in August. Rainfall was plentiful in the Northwest.

Apply for Hoover Dam Generators

Arizona Power Authority has made application for installation of two 82,500-kw. generators at Hoover Dam to guarantee Arizona's allocated power. The Arizona program contemplates construction by USBR of transmission lines from Hoover and Davis dams and extension from this arterial to remote sections of the state by the power authority. Nevada also is requesting installation of an 82,500-kw. generator to set up production for the two states and provide stand-by power.

Southern California Outlook

In southern California, snow pack was low, with insufficient water supply in Santa Barbara and Ventura. Most other sections were not expected to be short on domestic water supply. Hoover Dam had ample storage from precipitation in the Upper Basin states, assuring water reserves for Los Angeles, if needed, and power for the area.

Redondo Unit on Line

Southern California Edison Co. on Feb. 23 placed in operation the first 60,000-kw. unit of its new 264,000-kw. Redondo Beach steam electric plant. The second 66,000-kw. unit will go in service in May and two additional units to be installed next year will complete the station. The present unit gives Edison total operating capacity of 1,460,180 kw. in fuel and hydro plants. This will be increased soon by a 35,000-kw. hydroelectric unit at Big Creek plant No. 3 in central California.

New Coulee Generator

Eighth generator at Grand Coulee Dam's west power house went into operation on Feb. 12 to bring installed rated capacity to 864,000 kw. It is estimated that peak loads of about 1,040,000 kw. can be handled.

Bonneville-PP&L Tie

Pacific Power & Light Co. has rushed to completion an interconnection at St. Johns substation between its system and Bonneville. The tie was made pending completion of a delayed major interconnection between the two systems at Bonneville's Troutdale substation.

Municipal Plan Defeated

Southern California's first municipal light and power ownership election in seven years was defeated at Long Beach on Feb. 24. The vote was 35,102 against and 9,207 for the proposal. The total vote in the special election was 48% of the city's registered voters. A proposal for municipal operation of the city bus system also was defeated, along with 16 other measures.

Rate Increase for Recreation?

A new use for municipally owned electric utilities is being studied by the Fort Collins, Colo., city council, which authorized a survey to determine whether customers favor a 10% rate increase to finance a recreation program for children.

Ask Bond Issue

Colorado Central Power Co., operating in communities surrounding Denver, has asked the State Public Utilities Commission for permission to issue $600,000 first mortgage (8¾%) bonds to finance expansion facilities. Colorado Central proposes to sell the entire issue, if approved, to the John Hancock Mutual Life Insurance Co. of Boston, which holds all of its other securities.

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SERVING THROUGH SCIENCE

FOR HIGH DI-ELECTRIC STRENGTH

Pick Security Friction Tape

High di-electric strength for high voltage jobs, plus strong rubbery adhesive with a terrific grip . . . that's Security Friction Tape. And Security has no pin holes, does not unravel when unwound from the roll. For electrical and general purpose jobs, big or little, you'll find straight-tearing, highly-insulating Security a tape you can trust.

Play Safe—Use Security

UNITED STATES RUBBER COMPANY

1230 Avenue of the Americas, New York 20, N. Y.

TIE IN NOW WITH THE BIG

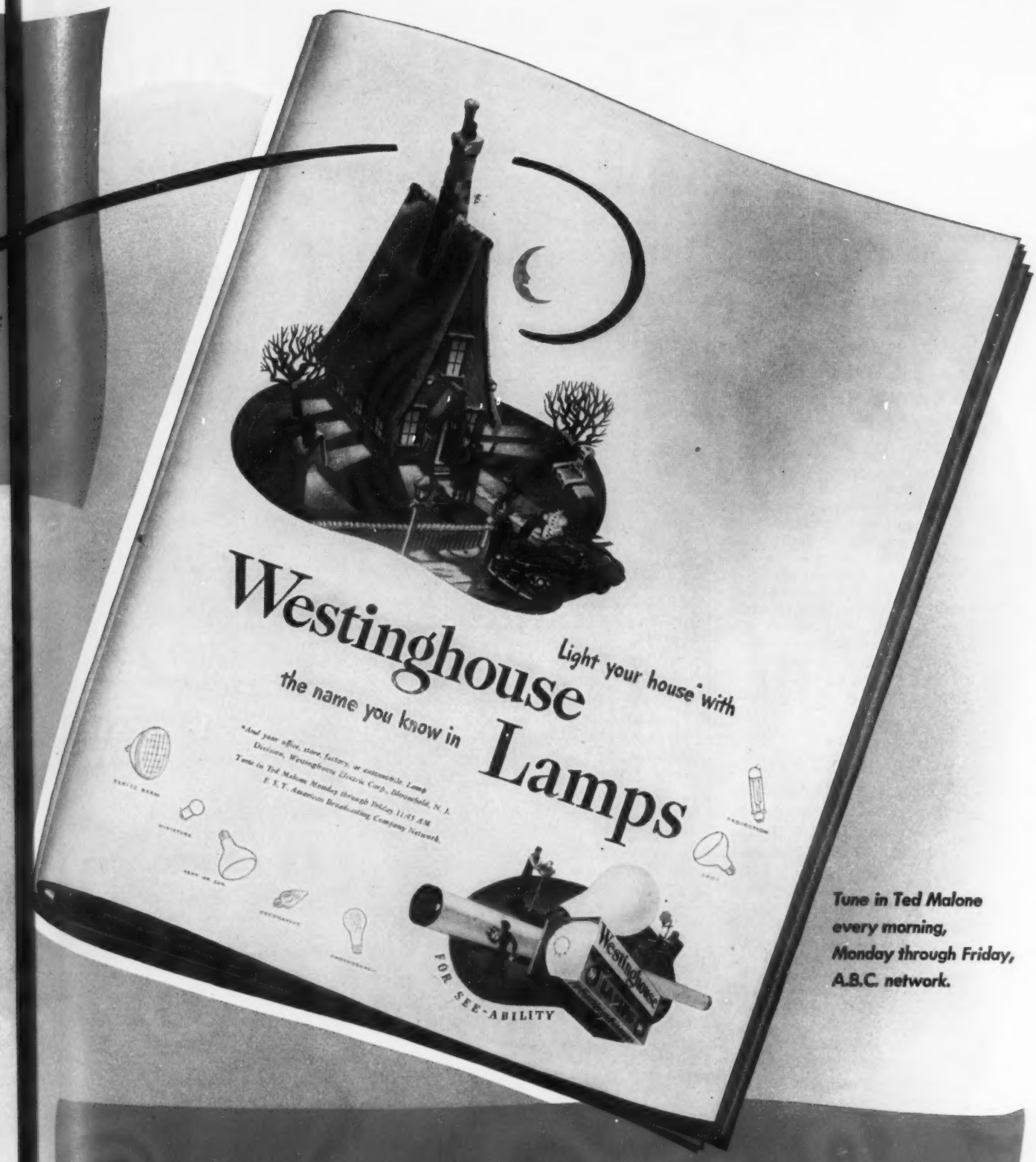
WESTINGHOUSE LAMP CAMPAIGN—

AND MAKE THAT CASH REGISTER SING!

Twelve full-color ads in the 10 weeks starting February 22 will be reminding your customers, "Light Your House with Westinghouse." But that's not all . . .

These ads, which will appear in the Saturday Evening Post, Time, This Week, and Parade, are just a part of a complete campaign. The full program includes sales-stimulating point-of-sale material, merchandisers, radio announcements, station displays, and other promotional aids calculated to make your cash register *sing!*

Tie in *now* with Westinghouse Lamp advertising . . . feature Westinghouse Lamps in your windows and store displays . . . and let the house that means Westinghouse build "Jack" for you! Lamp Division, Westinghouse Electric Corporation, Bloomfield, N. J.



Tune in Ted Malone every morning, Monday through Friday, A.B.C. network.

Westinghouse Lamps

PLANTS IN 25 CITIES ... OFFICES EVERYWHERE

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STANDS FOR SATISFACTION . . .

THE CUSTOMER SATISFACTION THAT HAS BUILT TRI-STATE SUPPLY CORPORATION TO ONE OF THE WEST'S LEADING SOURCES FOR QUALITY ELECTRICAL MATERIALS! FOR OVER 15 YEARS, THROUGH PEACE AND WAR, TRI-STATE HAS SPECIALIZED IN CUSTOMER SATISFACTION WITH QUALITY AND DEPENDABILITY . . .

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A FEW OF THE THOUSANDS OF SUPPLY ITEMS IMMEDIATELY AVAILABLE AT THREE TRI-STATE LOCATIONS

TAPES • WIRE • SOLDER • LAMINATIONS
INSULATING VARNISH • PAPER • TWINE
WEDGES • GREASE • ENAMEL • SEALER
CLOTH • CANVAS • INSULATION • CONNECTOR
CORDS • WEBBING • EYELETS • FIBRE
WASHERS • SLEEVING • TUBING • TAGS
MARKERS • YARN • LUGS • MICA • RODS
SHEETS • TUBES • PRESSBOARDS • TOOLS
SLOT WEDGES • CARBON BRUSHES
BALL BEARINGS • SLEEVE BEARINGS
MAGNET WIRE • ASBESTOS WIRE
LEAD WIRE • EQUIPMENT • SILICONES
SCOTCH TAPES • ROD AND TUBE
FIBRE SHEET • COMMUTATORS
CAPACITATORS • STAYBINDING

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A COMPLETE LINE OF MATERIALS FOR ELECTRICAL REPAIR, MAINTENANCE MANUFACTURED BY THESE NATIONALLY KNOWN COMPANIES

ANACONDA WIRE AND CABLE; BUNTING BRASS & BRONZE; COTTRELL PAPER; DIELECTRIC PRODUCTS; DOW-CORNING; ELIZABETH WEBBING MILLS; CONTINENTAL WIRE; P. D. GEORGE; HOOVER BALL BEARINGS; IDEAL INDUSTRIES; INSULATION MANUFACTURERS; KIRKWOOD COMMUTATOR; THE STEELDUCT; MICA CO. OF NEW YORK; MINNESOTA MINING & MFG.; NEW JERSEY WOOD FINISHING; OHIO CARBON; OWENS-CORNING FIBERGLAS; AND TAYLOR FIBRE.

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THIS MONTH'S NEWS

Power to Pay $324,000,000 of Columbia Basin Costs

Power sales will be required to pay an estimated $324,000,000 of the $400,000,000 over-all cost of the Columbia Basin project. This is an increase of $141,000,000 over original estimates on the allotment to power, according to Frank T. Bell, Ephrata, Wash., a member of the Bonneville Power Administration's advisory board.

Bell said that the most recent audits of Bonneville accounts arrived at the greater contribution of power to project repayment, in view of increased labor and material costs over original estimates.

"The Bonneville Administration," he said, "will be able to meet these costs on the basis of its present rate of $17.50 per kilowatt-year. Here on the project we feel that construction costs have reached their peak and that the total cost of the project is more likely to be scaled down rather than continue up in the future."

Bell said that Bonneville's share of the project cost had been scaled upward to $250 million last year due to the same reasons. In 1942, when irrigation features of the project were being established for construction, the power share had been estimated at $185 million, he said.

Under terms of contracts between basin irrigation districts and the Department of Interior, sale of power from Grand Coulee generators must pay all but approximately $85 per acre toward liquidation of project construction costs. Over-all cost of the Columbia Basin project by current estimates will exceed $400,000,000. This total cost must be repaid to the treasury within 50 years from the date water is delivered to each district.

● Pend Oreille PUD became the twenty-second operating PUD in the state of Washington, last month, with energizing of Bonneville's line from Spirit substation in Stevens County. The line extends from the substation at Mead through the Colville Valley to Metaline, where the Pend Oreille district has a service contract with BPA. Commissioner F. R. Jordan said the district will service the town of Metaline and an industrial load at the Grandview Mine; will also rebuild the lines in Ione and install a modern street lighting system.

ALL KINDS
of SMALL
TRANSFORMERS

—in the JEFFRIES line

Practically all your small transformer needs are supplied by the Complete Jeffries line. We have specialized for years in providing transformer to exactly match your requirements. If not in our regular line, we build to meet your specifications in a hurry!

Minimize your voltage losses. Specify scattered transformers to eliminate duplicate conduit runs, and save on power costs.

JEFFRIES TRANSFORMER COMPANY
1710 E. 57th St. Los Angeles 11, Calif.

TRICO AUTOMATIC OILERS

• PROTECT BEARINGS
• INCREASE PRODUCTION
• CUT MAINTENANCE COSTS

Actual performance records prove that better machine performance, improved maintenance and lower operating costs result when TRICO OILERS are installed.

- Reduce Bearing Failures.
- Stop "trust-to-luck" daily hand oiling.
- Safety against fire and accidents.
- Savings in labor—power—lubricants.
- Accurate—Automatic oil delivery.

MODERNIZE YOUR EQUIPMENT TODAY

They are easily installed, and you will always look with pride to your TRICO OILER installation.

GET ALL THE FACTS . . . WRITE FOR CATALOG

There's a size and style available for every application.

TRICO FUSE MFG. CO. Milwaukee, Wisconsin

GOLD SEAL *Award Winners*

SECOND INTERNATIONAL LIGHTING EXPOSITION

Four Gold Seal winners (out of twelve) and many Merit Award winners used Pittsburgh Permaflector Equipment in the installations which won them recognition in the Planned Lighting Competition held in conjunction with the Second International Lighting Exposition.

Here is conclusive evidence that practically and creatively Pittsburgh Permaflector Fluorescent and Incandescent Lighting Equipment is superior in performance and design.

Write today for complete details on how you too can achieve custom-designed illuminating results with this standard equipment.

"Pittsburgh" Permaflector

Gold Seal Merit Award to:
J. L. Phillips
Consulting Engineer
Entry: Family Reserve Insurance Bldg.
Architect: Warren, Knight & Davis

Gold Seal Merit Award to:
Lucian Kight & John Martin
Duquesne Light Co.
Entry: Royer's Dept. Store
Architect: Brandon Smith

Gold Seal Merit Award to:
C. B. Marsh
Marsh Electric Co.
Entry: Klein's Dept. Store

PITTSBURGH REFLECTOR COMPANY

OLIVER BUILDING · PITTSBURGH 22, PENNSYLVANIA

PITTSBURGH PERMAFLECTORS ARE DISTRIBUTED BY
BETTER ELECTRICAL WHOLESALERS EVERYWHERE

Lighting Engineers in All Principal Cities

"WIRE-NUTS"
(SOLDERLESS TAPELESS WIRE CONNECTORS)
USED HERE
New INTERNATIONAL TRADE MART
MARITIME ELECTRIC CO., Inc.
Contractors
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LEADING ELECTRICAL CONTRACTOR RECOMMENDS IDEAL "WIRE-NUTS"

H. M. Nunez, general superintendent, Maritime Electric Co., Inc., New Orleans, says: "Ideal 'Wire-Nuts' save time and make a reliable, positive, long lasting connection. With 'Wire-Nuts' we are sure of a well insulated connection which will assure permanency of the work . . . We find Ideal 'Wire-Nuts' outstanding in their application."

All the wire joints in this beautiful modernized building are made with Ideal "Wire-Nuts." These economical wire connectors make a joint that's better electrically, stronger mechanically—safe, compact, non-corrosive, resistant to heat and vibration. And it's all done in one simple operation — no solder . . . no tape . . . no tools!

Ideal "Wire-Nuts" are made in sizes for all usual wire combinations from two No. 18 up to and including three No. 10 solid or stranded. — IDEAL INDUSTRIES, Inc., Sycamore, Ill.

Wire-Nuts®
(THE SOLDERLESS, TAPELESS WIRE CONNECTORS)
Patented — No. 1,933,555
IDEAL Distributed Through
AMERICA'S LEADING WHOLESALERS

USBR TAKING BIDS ON HUNGRY HORSE DAM

Bureau of Reclamation last month asked for bids on the multiple-purpose Hungry Horse Dam. A 300,000-kw. power plant will be an integral part of the project.

Bids on the structure, to be the fourth largest concrete dam in the world, will be opened on the site April 1. Specifications call for construction of a dam 2,115 ft. long, with a maximum height of 520 ft. Only larger dams are Grand Coulee, Shasta and Hoover.

The bureau already has advertised for bids for manufacture of four 75,000-kw. generators and four 105,000-hp. hydro-turbines for the Hungry Horse power plant. It has tentatively scheduled installation of the generating units for June 1952, October 1952, February 1953 and June 1953. Partial storage in the reservoir, which will have a capacity of 3.5 million acre-ft., is planned to catch the spring runoff in 1952.

The dam is to be erected on the south fork of the Flathead River, nine miles southeast of Columbia Falls, Mont. The contract terms will call for completion within 2,000 days.

Operation of the Hungry Horse power plant will be integrated with the Bonneville Power Administration system and other Northwest Power Pool facilities, Reclamation spokesmen said. They also stated that the project would increase "by 334,000 kw. the firm power capacities" of existing downstream power plants at Kerr Dam and Thompson Falls, Mont., and at Grand Coulee, Rock Island, and Bonneville dams. Ultimately, they added, it also would boost by 477,000 kw. the firm capacities of downstream plants yet to be developed in the Columbia River systems.

Work already is under way at the site. Relocation of roads, construction of access highways, excavation of a diversion tunnel, and land clearing are among the jobs already under contract. Construction of an electric distribution system for the camp, together with a short transmission line connecting with the Flathead Electric Cooperative system, has been completed.

● APPROPRIATION of $1,521,000 for improving the city's electrical system has been authorized by the Tacoma, Wash., city council. One ordinance approved construction of a $1,476,000 double transmission line from the Nisqually plant at La Grande to the tideflats substation. Another provides $45,000 for a 10,000-kva. transmission bank for the substation. The 35-mile transmission line eventually will replace the line installed on completion of the original Nisqually plant.

Public Service of Colorado Building New Steam Plant

Immediate plans to construct an 80,000-kw. steam-electric power plant in Denver have been announced by John E. Loiseau, president of Public Service Co. of Colorado. The big project will be the next step in the company's announced $34,000,000 expansion program and will cost approximately $14,350,000. Of the total, some six millions have been allocated to projects now under construction.

The new power source will be known as the Arapahoe plant, largest ever put under one roof in Colorado. It will consist of two units, each 40,000-kw. capacity; one is expected to be on the line in 1950 to supplement an expected 20,000 kw. from the Colorado - Big Thompson diversion project, which will be insufficient for the demand, according to Public Service officials.

General Electric Co. will install the first unit's steam turbine generator on orders placed a year ago. Westinghouse will deliver the second, ordered in mid-1947. Both are scheduled to be in operation by 1951, two years in advance of the date when large amounts of power from Big Thompson generating plants can reasonably be expected.

A public relations gesture of considerable importance was made by Loiseau when he announced that the $14-million job will be built inside the Denver city limits, and be subject to local tax assessment, instead of just across the county line south, in Arapahoe County, where levies would be smaller. Loiseau's statement: "Our directors decided to make it a taxable part of the city it will serve."

The Arapahoe plant is in addition to the $4,400,000 expansion of Public Service Co.'s Lacombe plant in Denver, now nearing completion, and multi-million-dollar allocations for distribution system extensions, substations, and additions to facilities at Grand Junction and Alamosa.

● FPC has authorized amendment of Montana Power Co.'s license for its Flathead hydroelectric project. The company will be allowed to enlarge the Kerr power house and install a second 56,000-kw. generating unit. The second unit will increase annual output by 353,000,000 kwh. and the critical year output by 217,000,000 kwh., it was estimated. Dependable peaking capacity will be increased by 56,000 kw. a month. Construction is to be completed by January 1949.

THE SATURDAY EVENING

POST

MORE G-E LAMP ADVERTISING SUPPORT FOR THE NEW CERTIFIED LAMP PROGRAM

Here's another important General Electric sales message, recommending the new Certified Lamps to people everywhere. This full-page, full-color G-E Lamp advertisement appears in the Feb. 28 issue of The Saturday Evening Post, which will make it available to over 12,000,000 readers.

It's "High Fashion" Time in Lamps these days...

Not only More Light...but More Beautiful Lighting with

Certified Lamps

Women seeking beauty—men looking for eye comfort—are finding in these new Certified Lamps the ideal combination of "good looking" and "good seeing" they have wanted for so long.

Why don't you see these latest achievements of 2½ years of lighting research and the creative genius of over 100 of the country's leading portable lamp manufacturers today? Look for Certified Lamps wherever portable lamps are sold. All sizes, all types—and best of all . . . all prices!

General Electric does not make portable lamps for home lighting. However, we are glad to recommend Certified Lamps as a great step forward . . . toward easier seeing, eye comfort and eye appeal.

LOOK FOR THIS TAG!

It identifies the *new* Certified Lamps which

- . . . **give scientific control of light quality**
- . . . **give proper light distribution**
- . . . **protect against glare**
- . . . **provide plenty of good light for eye comfort**

. . . every lamp is built to 105 exacting specifications and certified by Electrical Testing Laboratories, Inc.

Be sure your new Certified Lamp is equipped with G-E lamp bulbs

100-200-300 watt for use in the large floor lamp . . . **55¢**

50-100-150 watt for use in table lamps, bridge lamps, swing-arm lamps, and pin-to-wall lamps . . . **33¢**

30-70-100 watt for use in dresser and dressing table lamps . **27¢**

G-E Circline Fluorescent lamp—32 watt—12 inch—used with filament bulbs in many large floor and table lamps to give *more light* . . . **$1.75**

When you buy bulbs for any purpose, always remember the constant aim of G-E lamp research to make all

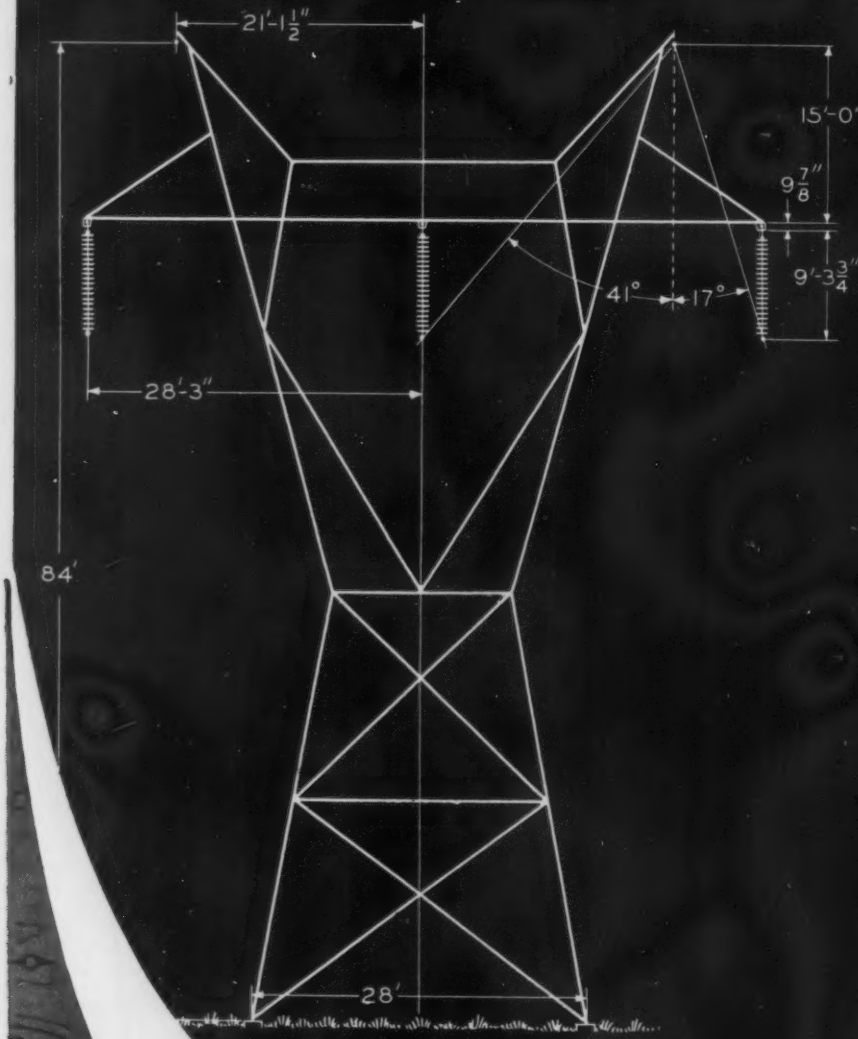
G-E LAMP BULBS

Stay Brighter Longer!

GENERAL ELECTRIC

Only four lightning outages 50 mile, 220-KV line of

RECEIVES YEARLY AVERAGE OF 43 STROKES TO LINE IN 35.5-STORM-DAY TERRITORY



COMPANY: Pennsylvania Water & Power Co.

LOCATION OF LINE: Between Safe Harbor and Riverside.

VOLTAGE: 220 kv.

LENGTH: 50 miles.

AGE: 10 years.

GENERAL DIRECTION: North-South.

AVERAGE TERRAIN: Rolling.

ANNUAL STORM DAYS: 35.5. (Average 86 recorded strokes to line, per 100 miles, per year.)

CONDUCTOR: 795,000 circ mil, A. C. S. R.

OVERHEAD GROUND WIRE: ⅜-in., 7-strand, E. H. Strength Copperweld.

MID-SPAN CLEARANCE: Conductor to ground wire, 34 feet.

SUSPENSION INSULATORS: 20 (5-inch) tangent. 20 (5¾-inch). Angle and Deadend.

NORMAL TANGENT SPAN LENGTH: 1,000 feet.

ARCING HORNS OR RINGS: None.

TOWER FOOTING RESISTANCE: Max., 19 ohms. Min., 1 ohm. Aver., 10 ohms.

COUNTERPOISE: Two to four wires parallel with line, of sufficient length to bring tower footing resistance down to desired value.

TYPE OF SYSTEM: Solidly grounded to "Y".

IMPULSE INSULATION: Critical positive, 1580 kv., 1½ x 40 mu-s wave.

NORMAL TOTAL TIME TO CLEAR GROUND FAULT: 12 cycles (60-cycle base).

GROUND FAULT NEUTRALIZER OR PROTECTOR TUBES: Tubes as relief gap at receiving terminal only.

ARC DAMAGE TO INSULATORS OR CONDUCTORS: No damage to conductors. Superficial damage to insulators in one flashover. See footnote.

AVERAGE ANNUAL LIGHTNING OUTAGES: Four in nine years, three of which were in terminal stations.

AVERAGE ANNUAL LIGHTNING OUTAGES PER 100 MILES: .78.

FOOTNOTE: Only one flashover has occurred on the line proper. The damage in this case was confined to surface burns on units No. 1, 13, and 20. There are 20 units in each string, and numbering progresses from ground to line.

in Nine Years on Pennsylvania Water & Power Co.

In the interests of technical progress of high-voltage transmission, this series of operating reports is presented to the Electrical Industry. As a manufacturer of insulators and hardware, the Ohio Brass Company is vitally concerned in this development. These reports and many others will soon be compiled in book form and made available to power company engineers.

2849-H

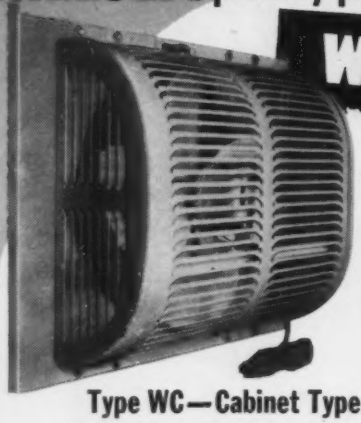
Ohio Brass

MANSFIELD, OHIO

Canadian Ohio Brass Co., Ltd., Niagara Falls, Ont.

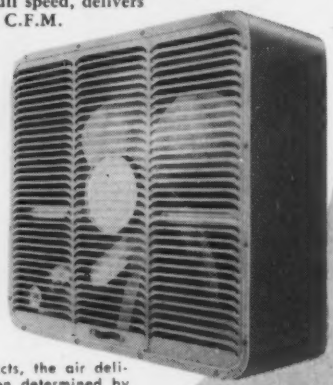
CHELSEA proudly presents its new package unit

WINDOW FANS



Type WP—Panel Type:

A three-speed, direct drive, portable window fan for effective operation in small homes, apartments, offices, stores, etc. Can be conveniently moved from window to window as desired. Fits window openings from 31 to 39 inches. At full speed, delivers 2000 C.F.M.



Type WC—Cabinet Type:

Designed for inside window sill mounting, this semi-portable fan is suitable for cooling and ventilating relatively large areas where permanent fan installations may be less desirable. Belt driven for quiet operation. Ample capacity for apartments of three to six rooms, homes, stores, lodge rooms and small factories. Available with outside automatic louver for year-round use. Two sizes, delivering 4500 and 6500 C.F.M.

As with all CHELSEA Products, the air delivery of these units has been determined by the Standard Test Code of the Propeller Fan Manufacturers Association.

LOOK FOR THIS SEAL!

WRITE FOR BULLETIN #852

CHELSEA FAN & BLOWER CO., INC.

1206 GROVE STREET, IRVINGTON 11, NEW JERSEY

CHELSEA

A SURE CURE FOR CAPACITOR TROUBLES

P.R. MALLORY & CO., Inc.

MALLORY CAPACITORS

TYPE MSG—AC Motor Starting Capacitor

The new foolproof Type MSG capacitor—with original equipment terminal spacing—is easy to install—no chance for error. The MSG is small and compact—*It Fits!*

FOR LONG, EFFICIENT, TOUGH SERVICE ...SAY MALLORY

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SITTLER COMPANY CHICAGO 7, ILL.

H. A. HOLDEN, Inc. MINNEAPOLIS 3, MINN.

SEATTLE CITY LIGHT ASKS CONSTRUCTION FUNDS

In a request to the Seattle city council, City Light Superintendent E. R. Hoffman proposed a $2,800,000 investment to enable the utility to meet the power demand it foresees for the near future. Hoffman obtained concurrence of the Board of Public Works in his request for the appropriation.

He stated: "We estimate the construction program will be completed in 1950. However, it is imperative that orders be placed immediately for the equipment, as delivery will not be made for many months."

Hoffman suggested that the sum asked be appropriated from present surplus in the light fund, as a loan to be repaid when funds are available in the construction fund.

Colorado Company Puts In Two-Way Radio Communication

Twenty-five vehicles equipped with two-way radio communication have been placed in service by Public Service Co. of Colorado in the Denver district, which includes such suburban areas as Aurora, Arvada, Golden. An additional 30 will be added to the fleet this year, company officials said.

The innovation has been contemplated for several years since allocation by the Federal Communications Commission of wave bands in the area for such purpose. A transmitter, located in North Denver, operates on a frequency of 37.62 megacycles, with call letters KPSD for the station, and KPSE for mobile units, which have a 100-mile range. The system greatly expedited service during heavy snow and subzero weather during the first week of its operation.

Radio dispatching is also expected to speed repairs on isolated stretches of gas lines feeding into Denver, and north, from Amarillo and Kansas gas fields, as well as on transmission lines strung across the bleakest of mountain territory and sparsely populated plains.

● B. C. Electric has been authorized to install a third 62,000-hp. generating unit at Bridge River to increase plant capacity to 186,000 hp. The first two 62,000-hp. units are under construction and the third is expected to be completed by the fall of 1949.

● Okanogan County PUD, Omak, Wash., will build a 2,000-kw. substation on land purchased from the city for $2,000. Paul Brissonneaud, local manager, says the plant is expected to be in operation within two months and to be completed by mid-summer.

1949 — Can Be a Good Year Too

You can expect good business to run on well through 1948.

But old-time competition is close upon us.

And 1949 will be a critical year for all of us – making lower taxation imperative NOW.

These are the main conclusions drawn from a nation-wide survey of industry's plans for new plants and equipment which McGraw-Hill has just completed. Here are the major findings:

1. Capital expenditures in 1948 may be a little lower — but at the most only 8% lower – than in 1947.
2. In 1949 capital expenditures may decline. 1949 plans are still fluid. However, those which have been projected now show a falling off. (Washington planners, please note: Current official attempts to discourage capital expansion may turn out to be superfluous – or downright dangerous.)
3. Industry's initial postwar rebuilding will be 85% complete at the end of 1948. When this first wave of deferred maintenance and expansion is finished, American industry will have more than half again the capacity it had in 1939. This does not mean the end of needed capital expenditures. Business will need to invest much more. (President Truman sets an investment goal immediately ahead of $50 billion.) But it does mean that tough competition is returning fast.

• IF YOU WANT *full details of the McGraw-Hill survey of Capital Expenditures, which is summarized in this editorial, write to the Economics Department, McGraw-Hill Publishing Company, 330 West 42nd Street, New York 18, N.Y.*

These are solid facts, based on plans which are firmly made by a broad cross-section of American industry and which the McGraw-Hill survey revealed.

The greatest contribution of this survey is the information it supplies on business plans for the purchase of new plants and equipment. What business planned to do about such expenditures was by far the biggest unknown element in the 1948 outlook. For, if business planned to slash its outlays for plants and equipment this year, that fact alone could bring a sharp downturn in business.

In making this survey, McGraw-Hill researchers all over the nation personally interviewed top executives of companies selected to make up a scientific cross-section of industry. Each executive was asked to give, *not his opinion* about general business trends, but *factual details* about his company's plans for 1948. By adding together the plans of the companies interviewed, McGraw-Hill has secured, for the first time, a reliable picture of what business plans to do in the months ahead.

Here are plans for 1948 and 1949, as revealed by the survey:

1. Industry still needs more than a year to finish its initial postwar maintenance and rehabilitation program.

Among manufacturing industries, top executives report that 64% of their program for the immediate postwar period is now complete. According to present plans, 85% will be installed by the end of this year even though some manufacturing industries still have a long way to go. For instance, oil companies will complete only three-quarters of their presently planned expansion program by the end of 1948.

2. Business may spend less on new plants and equipment this year than the record $16.1 billion spent last year. But the decline

probably will be negligible and certainly will not be great enough to bring on a business recession.

At the time McGraw-Hill interviewed top executives, some companies had not yet approved their 1948 capital budgets. Under the extreme assumption that those particular companies will make *no* capital expenditures in 1948, industry's 1948 bill for new plants and equipment will run to $14.9 billion, or 8% below last year's record figure. Under the more realistic assumption that those companies will cut their capital investment only as much as the companies which had already drawn up their plans for 1948, industry's 1948 capital budget will run to almost $15.8 billion, a decline of only $300 million from 1947.

Thus the over-all conclusion of the McGraw-Hill survey is that capital expenditures by business will be only slightly lower this year than last.

3. Business executives will not slash their 1948 capital budgets unless they are convinced that a real slump is in the offing—and they are not convinced now.

Almost two-thirds of all manufacturing companies say they would not cut capital budgets sharply even if business activity declined 20%. What is more, even a 15-20% boost in wage rates would have little effect on projected capital budgets. If wages go up, 57% of manufacturing companies would not change their capital budgets, 26% would increase them, and 17% would cut them.

4. Most executives look for an increase in their company's sales this year.

More than half of all manufacturing companies are planning on a sales increase over last year of 10% or more. A third of them say sales will be about the same as in 1947. And fewer than 10% look for lower sales.

5. Manufacturing companies will finance much of their purchases of new plants and equipment in 1948 from funds set aside out of past or current earnings.

Utilities and railroads, on the other hand, must go to the securities markets or commercial banks to finance most capital expenditures.

Although manufacturing companies say they can finance this year's capital expenditures in large part from current profits and past savings, all evidence indicates that, to do so, they will use up most of the funds they earmarked during the war for this purpose. So in 1949, industry must go to the capital markets or to the commercial banks if it is to continue to spend for capital purposes. If the securities markets continue to lie in the doldrums, *as they will under present tax laws*, only companies with triple A credit ratings will be able to raise funds that way.

6. Purchases of new plants and equipment may fall off in 1949.

The McGraw-Hill survey collected all available evidence on plans for 1949 capital budgets. Fewer than 40% of all manufacturing companies now have definite plans for 1949. Of those that have plans, 45% intend to spend less than in 1948, 30% plan to spend the same amount, and a quarter expect to spend more. These preliminary decisions would seem to indicate that capital investment may fall off in 1949.

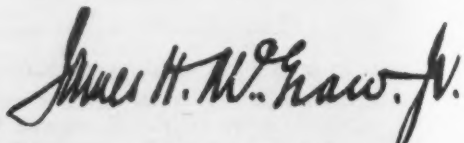
7. Industry's production capacity in 1949 will be far above prewar.

Manufacturing capacity will be more than 50% greater than in 1939 once the present wave of postwar building is complete. Almost a third of all manufacturing companies report that their capacity will be double or more than double the prewar figure. Thus, 1949 may see a huge increase in production of many things that now are hard to buy.

The last two points in this summary mean that 1949 will be a critical year. We must forestall a sudden drying up of capital expenditures in that year. We must be able also to absorb a great outpouring of production both of capital and consumer goods.

What will happen to business in 1949, therefore, will depend on how successful we are this year in dealing with such momentous problems as taxation, foreign aid and prices. But 1949 *can* be a good year too.

The next editorial in this series will discuss the pivotal problem of taxes.



President, McGraw-Hill Publishing Company, Inc.

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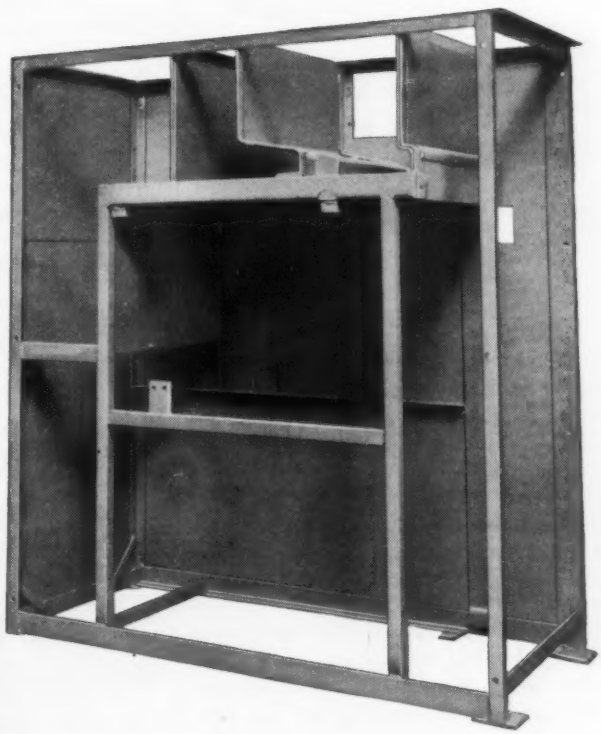

A RECENT SURVEY disclosed that operating engineers were most impressed with the rugged construction of Allis-Chalmers switchgear. It's easy to see why. A-C framework of steel angles and formed plates is welded together and reinforced to form a *rigid, self-supporting* structure. For example, all joints are lap-welded for greater strength. Structures are assembled on two full length sill channels providing simple four-point support. Result: only *four-point alignment* necessary. Engineers also liked the rolled edge extending around all sides of A-C doors making them sufficiently strong to require only a *single latch* for tight closing.

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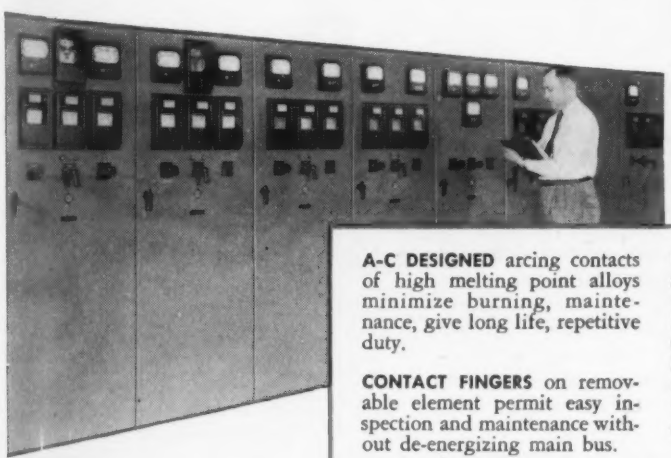

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PUGET POWER EMPLOYEES ACCEPT WAGE DECISION

Puget Sound Power & Light Co. employees voted 1,162 to 585 for acceptance of a 15-cent hourly wage increase recommended by the fact-finding board appointed in January (ELECTRICAL WEST, February, p. 146.)

Retroactive to Jan. 1, the increase will cost the company an additional $900,000 yearly. It is said to be the highest granted to power company employees anywhere in the United States this year, exceeding by nine cents the six-cent-an-hour boost given to southern California electrical employees recently.

Reaction of 260 outdoor employees of Puget Power to the new contract was uncertain. They staged an unauthorized work stoppage Jan. 13-15 in a demand for 20 cents an hour additional, which they declared was justified by the greater hazards of their work. The union presented no support for the outdoor men's case and the federal fact-finding board found no "justification" for a further increase for outdoor employees. The board said it considered the case on a cost-of-living basis.

As Local 77's negotiations with the private company apparently were settled, its negotiating committee opened the union agreement with Seattle City Light, where the union is asking an increase of 45 cents an hour. Another contract has been made at Centralia, where Centralia City Light employees were granted an increase.

Court Order Sends L. A. Workers Back to Work

A court order on Feb. 15 ended a 10-day strike of AFL building trades unionists on construction projects of the Los Angeles Department of Water & Power. More than 350 union members and some 575 civil service workers went back to work under an order of Superior Judge Clarence M. Hanson, restraining workers from picketing at half a dozen struck projects and from labeling them as unfair.

Attorneys for the department secured the restraining order on plea that continuation of the strike on $50,000,000 worth of construction projects would threaten the city with a water shortage.

Attorney Arthur Garrett, representing the Building Trades Council, said the unions would abide by the decision but would fight the injunction action in court.

Department officials contended that demands of the Building Trades Council were designed to force a closed shop and union hiring hall for power department building projects. Union officials countered that the strike was called only to keep the city from using civil service workers on jobs that rightfully belonged to AFL construction workers.

Traditionally, department building has been done partly by private contractors, hiring AFL workers, and partly by civil service employees of the department.

The majority of civil service workers remained on the job during the strike. The department had served notice that employees absent ten days without valid excuse would be discharged.

Central Arizona, IBEW Sign Wage Contract

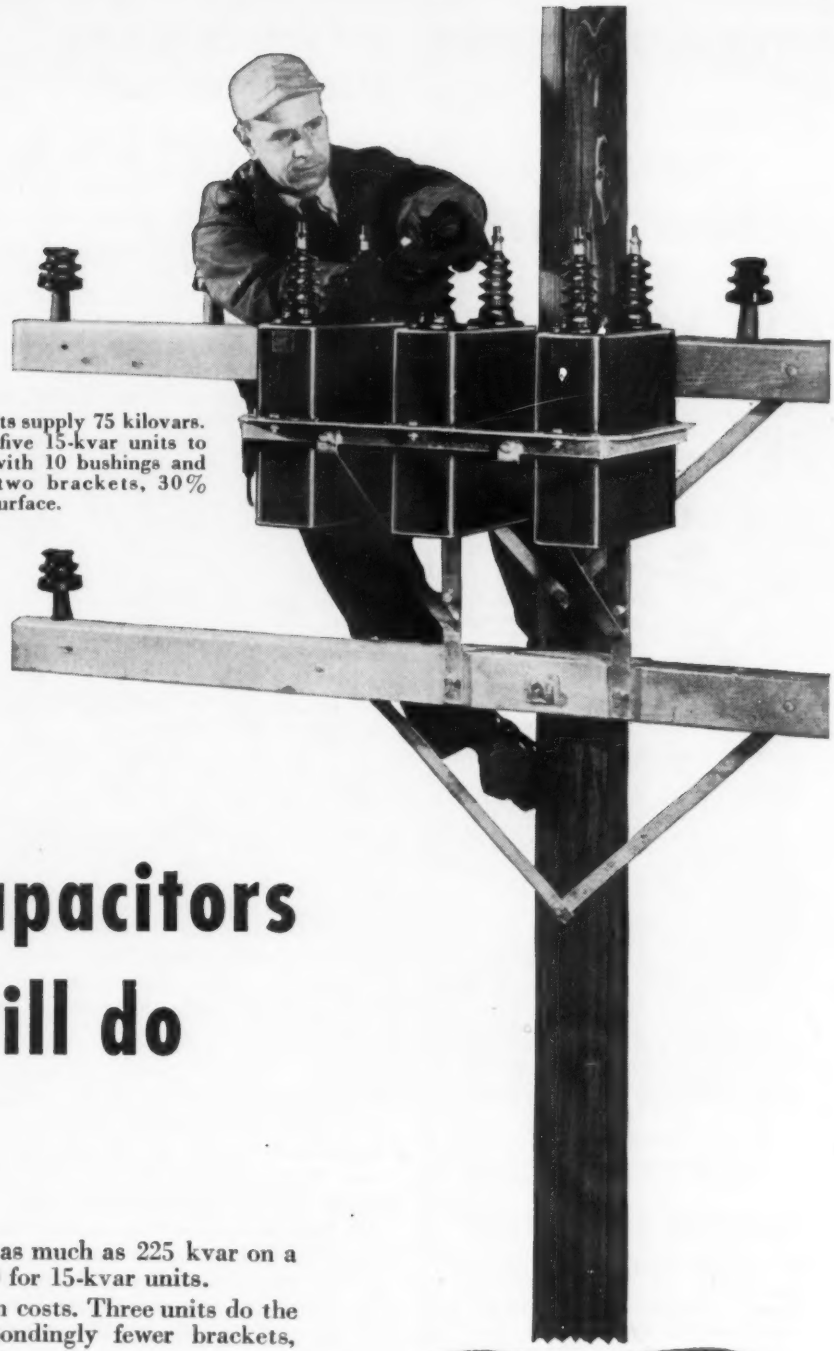
With both sides refusing to divulge wage-increase information, officials of the Central Arizona Light & Power Co. and the International Brotherhood of Electrical Workers, jointly announced in Phoenix, Ariz., the completion of a new contract for the coming year.

The provisions include wage adjustments, the joint release said, and the "correction of inequities among various work classifications." Stipulated are provisions for adjustments in holiday pay for shift workers, vacations, sick leaves, pay days, and adoption of a "more desirable apprentice arrangement and the undertaking of a comprehensive job analysis and evaluation program."

L. K. Doutrick, company vice-president, also announced that, effective Feb. 1, substantial increases were granted workers in construction, production and maintenance.

California Electric Power Raises Pay of IBEW Workers

California Electric Power Co. last month agreed to give IBEW workers a 5-cent-an-hour increase, retroactive to Dec. 1, and an additional $10.30 monthly after March 7, bringing their scale to approximately $317. The agreement also provided that supervisory employees will vote on whether or not they want union representation and that all qualified employees will vote on a union shop. The IBEW local had asked a 15% increase for journeymen electrical workers to $345, unionization of supervisors and a union shop. Federal Conciliator John Phau announced that the company and union had reached an agreement on Feb. 3, the day before a strike deadline set by the union.



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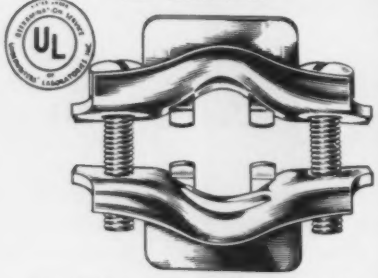

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ASK VOTE ON ELECTRIC SPACE HEATING RATES

Following a Washington State Department of Public Utilities' ruling denying Puget Sound Power & Light Co.'s request for higher electric space heating rates, the Seattle Electric Heating Assn. is circulating petitions calling for a public vote on power rates for City Light.

City Light last year was granted permission by the city council to increase its space heating rates. Approval of the department of public utilities was not required. When Puget Power asked permission to establish similar rates, the department ruled that the rates would establish a differential between consumers and could not be approved as fair.

The Electric Heating Assn. has a petition before the city council for repeal of the City Light increase but has not been able to secure action, according to William Clibborn, chairman of the rate committee.

The proposed initiative would give Seattle a residence rate averaging about 70 cents a month lower than former rates, according to Clibborn. Rates would remain the same for the first 300 kw. a month, but the all-electric $5 rate would continue through 500 kw. under the initiative, as compared with the present rate of $5.70. The rate for 2,500 kw. would be $22, as compared with the existing rate of $34.

● ELLENSBURG, Wash., city council has under consideration an ordinance amendment which would ban all flat-rate water heaters by Jan. 1, 1950. Light Superintendent Lewis Ambrose was instructed to report on the cost of installing electronic equipment to turn off the heaters during peak loads. Taking 1,000 kw. of water heater demand off the peak would save the city $750 a month on the demand charge for stand-by service by the Bonneville Power Administration, Ambrose said.

● OBJECTION of San Franciscans to modernization of the city's 35-year-old "Path of Gold" lighting on Market St. caused Utilities Manager James H. Turner to announce a change of plans. Instead of a complete revamping of the old carbon arc system, present bulbs will be replaced with incandescent fixtures. Some change is necessary because manufacturers have stopped making carbon replacement elements for the carbon arc lamps, installed during the city's Panama-Pacific International Exposition in 1915. Turner estimated that the city will save $300,000 by retaining the old fixtures.

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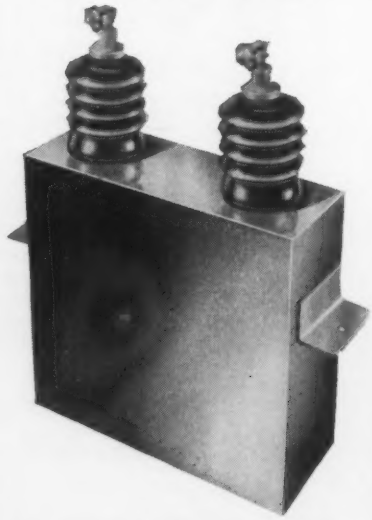

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PEPCO REORGANIZATION NOW COMPLETE

Winding up reorganization proceedings which have taken ten years to complete, the exchange of Portland Electric Power Co. securities for cash assets and common stock shares of the dissolved utility's principal subsidiary, Portland General Electric, commenced on Feb. 2. Approximately $15,000,000 in cash was being distributed, $10,957,000 of the sum representing remaining Pepco assets and $3,900,000 representing accumulated contingent dividends declared by PGE out of earnings since Oct. 31, 1945.

Coincident with consummation of the Pepco reorganization plans was appointment of eleven new PGE directors by Federal Judge James A. Fee, in whose court the reorganization was litigated under Chapter X of the federal bankruptcy act.

The new directors are James H. Polhemus, PGE president and a member of the old PGE board; Thomas W. Delzell and R. L. Clark, independent trustees for Pepco during its reorganization, and William C. Christensen, Wade Newbegin, Ralph Thom, Sidney F. Woodbury, Lloyd J. Wentworth, John A. Zehntbauer, Henry R. Cabell and James J. Walton, all of whom are Oregon business men.

At its initial meeting the new board chose Delzell as chairman, and as such he will have primary responsibility for financial matters affecting the company. Delzell has a varied utility background and is acquainted with PGE properties by virtue of his tenure as Pepco trustee. During his trusteeship direct financial benefits were made for Portland General Electric in excess of $10,000,000 through litigation with Chase National Bank, tax savings and depreciation reserve adjustments. In 1938-39 Delzell was assistant Public Utilities Commissioner of Oregon, and from 1922 to 1936 was an employee and operating executive of California Oregon Power Co.

Present officers of PGE have been retained by the board without changes other than the promotion of Waldemar Seton, former treasurer, to vice-president in charge of administration, and elevation of T. W. Fryou, former controller, to the treasurer's post.

● OFFICE WORKERS employed by Pacific Power & Light Co., by a vote of 189 to 109, rejected acceptance of the Office Employees International Union, AFL, as a bargaining agency. The vote was recorded in a NLRB election covering all company territory in Oregon and Washington.

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NEWS ABOUT PEOPLE

● MARSHALL MC K. "TWEEDY" KOCH has been made vice-president and superintendent of electric operations for Public Service of Colorado, succeeding the late Floyd F. McCammon. Koch has been with the company and related companies since 1914. A graduate of Cornell University and a World War I veteran, he was superintendent of the electrical distribution department from 1921 to 1947, when he was advanced to assistant superintendent of electric operations.

Koch

● RECENTLY RETIRED from Idaho Power Co. service are H. L. SENGER, assistant to the general superintendent, and C. O. CRANE, superintendent of transmission. Senger, whose service totals more than 39 years, has worked as engineer, superintendent of construction, and chief engineer as well as assistant to the general superintendent. Crane has spent 38 years with the company in transmission and substation construction work.

● RICHARD N. PARKIN has been chosen San Francisco port engineer for Westinghouse Electric Corp., succeeding W. N. HORNBERGER, who has been transferred to Philadelphia. Prior to his appointment Parkin served as planning supervisor at the company's Sunnyvale, Calif., plant.

● A. H. HEITZLER JR., has been appointed representative in the Los Angeles area for General Electric clocks, sunlamps, heating pads, foot-warmers, and heaters. Joining the Public Service Co. of Colorado in 1946, he later became assistant buyer for the May Co. in Denver.

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When G. H. P. Dellmann (center) retired after many years of service with San Diego Gas & Electric Co., his long-time associates in the company gave him a handsome traveling case. Left to right are Walter Chapman, Edward Meise, Al May, C. E. Perkins, Dellmann, Forrest Raymond, A. E. Hollowoy, vice-president in charge of sales, A. I. Benedict and H. I. Dillin. Originally with General Electric Co. in Los Angeles, Dellmann served in the sales department on power, lighting, street lighting and government relations

● JOHN LUCIAN SAVAGE of Denver, former chief designing engineer for the U.S. Reclamation Service who resigned to become one of the world's highest-paid private consultants in his field, was en route, Feb. 13 (Friday, too) to inspect 25 of the world's largest power and irrigation projects in Australia, India, Spain, Switzerland and Spanish Morocco. Unscheduled is a visit to Chinese Yangtze River project where communists do not collaborate with the official government in guaranteeing safe conduct. Of particular interest to Savage is the Punjab Dam which will rise 480 ft. above the Sutlej River to store 4½ million acre-ft. of water. Indian engineers selected Denver bureau of reclamation offices to study new techniques in high dam construction, but they remain masters of canal layouts.

● COLORADO SOCIETY OF ENGINEERS elected Lawrence M. Robertson, transmission and station engineer for Public Service Co. of Colorado, president, at its recent annual convention in Denver. Robertson succeeds Paul Y. Seyler of the Mountain States Telephone and Telegraph Co.

● COLORADO CENTRAL POWER CO. has announced the election of J. E. WILSON and LEE R. JONES as vice-presidents. Francis K. Godwin, former vice-president and general manager of Colorado Central, was transferred as president of East Coast Electric Co. at West Point, Va.

● SACRAMENTO, Calif., Municipal Utility District's board of directors has accepted the resignation of Tom Richards and named Theodore J. Labhard as his successor on the board. Labhard is trust officer for the Capital National Bank. The board also signed a new three-year contract with James E. McCaffrey as chief engineer for the district, increasing his salary from $12,500 to $16,500 annually.

● APPOINTMENT of MONTE M. WHEELER as San Francisco representative for General Electric heating devices and fans was announced recently by B. M. Tassie, Pacific district manager of appliance sales. Wheeler was formerly with McManus & Morgan Inc., in Los Angeles, where he became general manager. After war service in the Navy, he served as assistant manager of sales of the Anakan Lumber Co. in the Philippines.

● R. R. LA MAR has been appointed supervisor of residential sales for the Portland General Electric Co., Portland, succeeding James McKay in dealer relations work in the Portland area. McKay is now with Graybar.

● HARRY J. WILLIAMS has joined Columbia Steel Co., San Francisco, as assistant to the director of public relations. He was formerly associate editor of McGraw-Hill magazines *American Machinist* and *Product Engineering*.

● RALPH I. PETERSON has been named San Francisco representative for U. S. Steel Supply Co., with offices at 391 Sutter St.

● WILLIAM E. DIBBLE, a senior at Herbert Hoover High School, Glendale, was one of the finalists in the seventh annual nation-wide Science Talent Search sponsored by Westinghouse. Forty high school seniors were granted a trip to Washington D. C. to attend the five-day Science Talent Institute and to compete for $11,000 in Westinghouse Science scholarships.

● WILLIAM J. MCCRYSTLE has been named to succeed IRVING C. HARRIS as acting construction engineer at Shasta Dam, according to James K. Carr, district manager of the U. S. Bureau of Reclamation. McCrystle has been employed as an electrical and mechanical engineer by the bureau for more than 14 years.

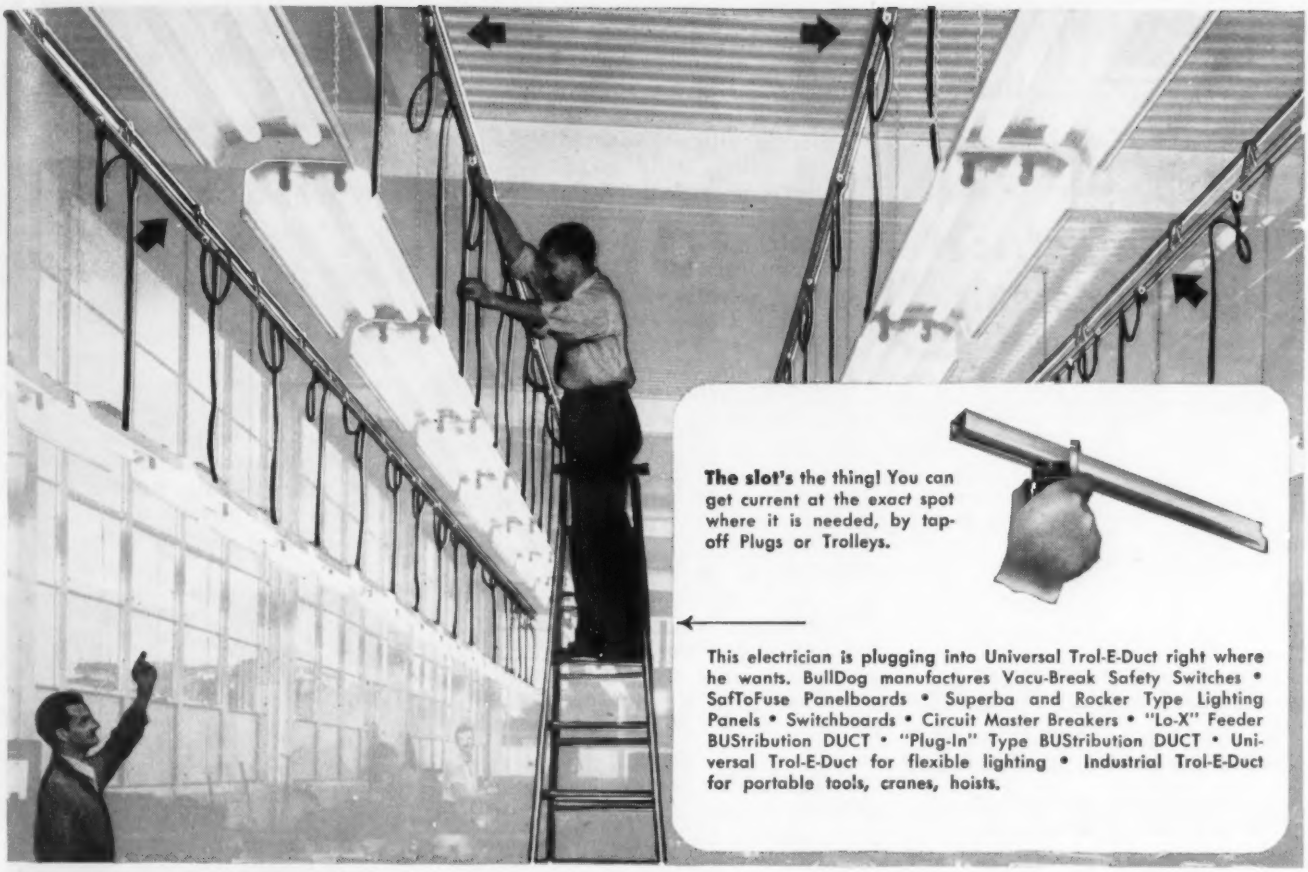
● L. D. FOWLER, Oakland, has been named manager of the Oakland motor sales division of the General Electric Co.'s small and medium motor division. Fowler has been with the company since 1923.

● R. E. GRANTHAM, senior power dispatcher for City Light at Seattle, retired Dec. 1. He began work for the city in 1905 in the engineering department and later transferred to City Light.

● K. H. P. JONES has been named manager of the Sacramento branch of the Westinghouse Electric Supply Co., succeeding Clark Baker Jr., who resigned. Jones was formerly apparatus and supply manager of the company's Oakland branch.

Deaths

Clifford J. Strike, dynamic, resourceful, eloquent and friendly president and chairman of the board of Idaho Power Co., died in Boise Feb. 11, aged 52, of cancer. Forseeing his fate he had relinquished the general managership last June to T. E. Roach, executive vice-president, who now succeeds him in the presidency. Mr. Strike came to Idaho Power in 1938 from Northwestern Public Service Co., into which, after organizing Consumers Electric Service Co. at Webster, S. D., he had brought it. He had begun in the electric business as a lineman in 1915, been a contractor, organized this company in 1921, became sales manager of Northwestern and in 1931 was president of it and of three affiliated companies. In Idaho Power he carried through the SEC reorganization with flying colors, bought out an REA, anticipated power needs in time to complete additions to the company's hydro system last year, and was a dynamic force in Idaho business circles. He was president of Northwest Electric Light & Power Assn. in 1940-41; a director of Edison Electric Institute since last June.



The slot's the thing! You can get current at the *exact* spot where it is needed, by tap-off Plugs or Trolleys.

This electrician is plugging into Universal Trol-E-Duct right where he wants. BullDog manufactures Vacu-Break Safety Switches • SafToFuse Panelboards • Superba and Rocker Type Lighting Panels • Switchboards • Circuit Master Breakers • "Lo-X" Feeder BUStribution DUCT • "Plug-In" Type BUStribution DUCT • Universal Trol-E-Duct for flexible lighting • Industrial Trol-E-Duct for portable tools, cranes, hoists.

Is your lighting system light-fingered?

IN MANY WAYS, old-style lighting systems take money right out of your pocket.

They start picking your pocket every time you move a fixture. First, there's the cost of a rewiring job. Then there's the cost of the production shut-down when current is cut off to tap in. Finally, there's the cost of materials scrapped to make the change.

Even no change costs money

And what if you decide to save this expense by making the old lighting layout suffice? Even then you'll find the old system takes away profit dollars, through reduced production caused by inefficient lighting.

The solution

Do away with these losses; install BullDog Universal Trol-E-Duct! This modern electrical system provides current *when* you want it, exactly *where* you want it.

BullDog Universal Trol-E-Duct is completely flexible. It serves lighting fixtures of any type, and portable tools as well. At any point along its continuously slotted duct, twist-out plugs or trolleys can tap off power from the totally-enclosed bus bars. It's safe . . . simple . . . quick!

All parts salvable

Where a major plant change might necessitate moving the entire electrical system, you can take down BullDog Universal Trol-E-Duct and reinstall it according to new requirements. All material can be re-used —*you scrap no parts.*

Ask your BullDog Field Engineer to show you a Universal Trol-E-Duct installation near your own plant. Or, write BullDog direct for descriptive folders.

BullDog's Field Engineers welcome the chance to sit in on planning stages of a building project. Their knowledge of electrical distribution layout can mean savings in installation and maintenance costs, as well as highest efficiency and reliability in actual operation. Why not take advantage of this pre-building service?

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DETROIT 32, MICHIGAN—FIELD OFFICES IN ALL PRINCIPAL CITIES

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Safety Switchboard Company
1445 Stevenson St. Tel., Hemlock 1-2470
San Francisco, Calif.

Mullenbach Electrical Manufacturing Co.
2300 East 27th Street Tel., Jefferson 2224
Los Angeles, Calif.

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BOOST

your electrical appliance sales

Test them 10 DAYS at our expense

Here's a practical handbook that gives you *all* the answers to your appliance sales problems—helps you sell major electrical appliances—refrigerators . . . ironers . . . cleaners . . . ranges, etc.—*whatever* the competition.

It puts punch into your sales talk with hard-hitting facts and figures on competitive fuels and power sources—helps you demonstrate the greater convenience, economy and all-round value of electricity. Complete, up-to-date—it's a real profit-builder—a handy source of sure-fire sales ideas whenever you're up against a tough competitive problem.

JUST PUBLISHED!

THE ELECTRICAL APPLIANCE SALES HANDBOOK

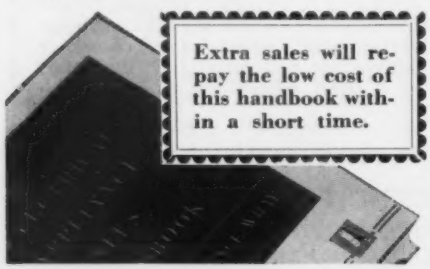
by LAWRENCE WRAY

Managing Editor, Electrical Merchandising

227 pages, illustrated, $3.50

This handy pocket-manual shows you how to analyze prospects . . . how to build up an effective sales story . . . how to sell electricity as a power source . . . how to sell more electric water heaters and ranges—more electric refrigeration, home laundering, cleaning and farm equipment.

It boosts electricity as a time, money and energy saver—concisely analyzes the electrical appliance market—outlines successful techniques of appliance selling—*gives convincing, sales-closing arguments as to why electricity out-performs all other power sources.* Detailed statistics on the uses and advantages of various electrical appliances enable you to tailor your approach to the particular needs of the prospect—turn him into a cash customer more quickly—more often.



Extra sales will repay the low cost of this handbook within a short time.

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● ALBERT FRANCIS MORAIRTY, 60, who retired Feb. 1, 1946, as vice-president and assistant general manager of the Central Arizona Light & Power Co., died Jan. 29 in Phoenix. Long a leader in utility business in the Salt River Valley, Mr. Morairty was directly responsible for a large part of the industrial development of the Phoenix area. He began his power company career in Colorado after being graduated in electrical engineering from the University of Michigan in 1911. From manager of the electric plant of the Colorado Power Co. at Monte Vista he became manager and franchise director for most of the state. He went into business in Sterling, Colo., as an electrical contractor at one time, but returned to Colorado Power and went to Alamosa to take charge of San Luis Valley operations. In 1925 he went to Phoenix to set up the sales department of Central Arizona Light & Power, then owned by the Electric Bond and Share Co. He was promoted to vice-president and assistant general manager in the early 1930's.

● RALPH W. WILEY, cocky, playful, excellent administrator, chief of San Francisco's Department of Electricity since 1920, inventor of the "birdcage" electric traffic signal unique to San Francisco, died Feb. 7, aged 62, after long illness and several accidents. He was born in Illinois, joined the San Francisco electrical department as underground engineer in 1912, later was made chief, designed and built the city's fire alarm system. He was president of International Association of Electrical Inspectors in 1936-37 and a member of its executive council for many years, also served on the Electrical Committee. He pioneered appliance sales control and initiated many regulations that have since been made a part of the National Electrical Code.

● WARREN SIMMONS, veteran city salesman for Graybar in San Francisco, died Feb. 10 during an operation occasioned by an odd accident—some meat had lodged in his throat and was being removed surgically. He had been with Graybar about 30 years and contacted all major accounts and utilities.

● A. WESTERWICK, 60, electric shops superintendent for the Salt River Valley Water Users Assn., died recently in Phoenix, Ariz. Born in Pittsburgh, Pa., he served in the association's electrical department for 23 years.

● HARRY E. HAUER, Bendix sales representative in Fresno for the Leo J. Meyberg Co., died on Feb. 4.

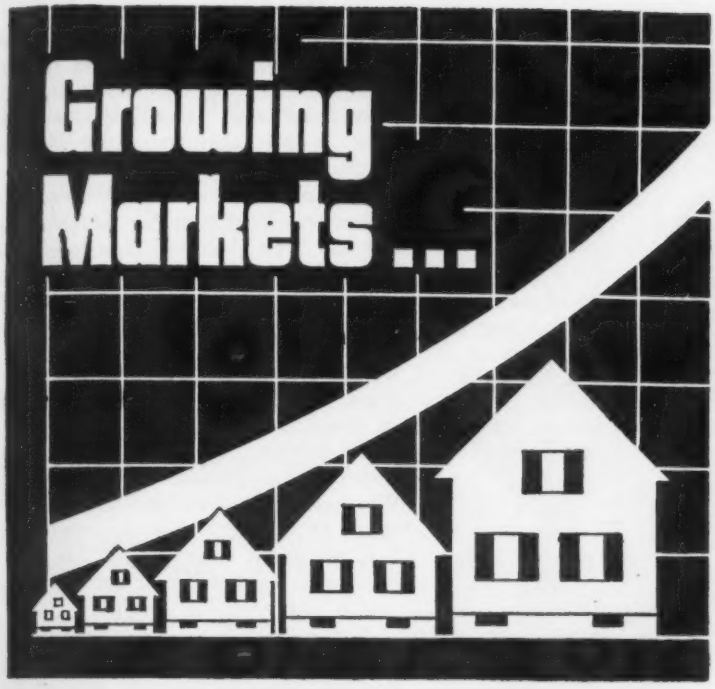
NOTES ON THE TRADE

● B. T. HEINZ Co. has been appointed representative for the states of Washington, Oregon, Idaho and Montana for the Allen and Olsen Mfg. Co. of Venice, Calif., makers of slimline fluorescent lighting fixtures. B. T. Heinz, who last year was IES chapter chairman, has been in lighting since 1934, first with Puget Sound Power & Light, then General Electric Supply and then as Silvray representative and manufacturers agent. He also handles La Salle Products Inc., Silvray, and Thompson Electric Co. products.

Heinz

● PHILIPS B. PATTON, who has served for the past two years as technical coordinator of the mobile communications division of the Farnsworth Television & Radio Corp., has been appointed West Coast engineering and sales representative of the division. He will make his headquarters at 42 Beverly St., San Francisco, and will represent Farnsworth's mobile products in California, Oregon, Washington and Nevada.

● PERLMUTH-COLEMAN ASSOCIATES of Los Angeles, manufacturers' representatives, have extended their coverage to include Wyoming, Utah, Colorado, New Mexico and Idaho. Already served are California, Washington, Nevada, Oregon and Vancouver, B. C. The firm represents the Clarostat line of resistors, controls and resistance devices.



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Are you in on the broad outlets for flexible conduit — "Greenfield" — that today's markets offer you? Are you taking advantage of this fast, easy-to-install protection wherever you can? Check over these timely uses for flexible conduit — they can make more business for you!

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The Raceway for hazardous conditions is rigid conduit. G-E White is *hot-dip* galvanized for extra protection against atmospheric corrosion. To resist chemical corrosion, use G-E Black. Its baked-on enamel is best for protecting wiring from corrosive liquids and fumes. (We're doing our best to get rigid conduit to you as fast as you want it — place your order now, and we'll give it prompt attention.)

Still Carrying a large assortment of bar hangers to fit various joist and stud spacings? It's not necessary, now. With just one size of General Electric S-type bar hanger — SP6620 — you're prepared for studs or joists on centers from 6 to 16 inches. A larger size — SP6620L — is available for use on centers up to 24 inches. A radically *new* fixture stud holds box or fixture securely in place.

Ready Now for Delivery are General Electric nonmetallic cable connectors. Simple, locking flange slips into box knockout easily from outside. Just insert cable and tighten two screws. Fits all common types of PVX and BraidX.* Ask for Cat. No. SP7250 and, while you're at it, let us tell you about the *full* line of General Electric conduit products.

*Trade-mark Reg. U. S. Pat. Off.

Perfect Mates!

With or Without Nut Retainers

This Sherman Connector assures tight, permanent, ***dependable*** wire connections, without excessive wrench torque, because threads on both body and nut are machine cut, and checked with precision gauges to mate perfectly.

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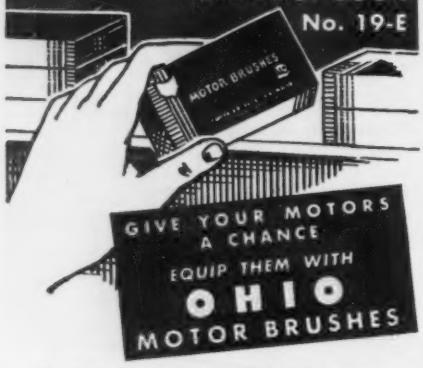
Battle Creek, Mich.

Sherman
SPLIT BOLT CONNECTORS

CARBON BRUSHES AT YOUR *Fingertips* WITH REFERENCE BOOK No. 19-E



ORDER AN ADVANCE STOCK AND INSTALL AT A MOMENT'S NOTICE

In Catalog 19-E, brushes are listed alphabetically by motor and equipment manufacturers name. At least 15,000 styles of motors are listed. It's a plain "dollars and sense" policy to order an adequate stock of emergency brushes, a few sets of each, and preserve economy in your motor maintenance.

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John A. Manning Paper Co., Inc.
Pressboards

Owens Corning Fibreglas Corp.
Fibreglas Tapes, Sleevings and Tying Cords

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LOS ANGELES 15
1325 San Julian St.

SEATTLE 1
166 Jackson St.

SAN FRANCISCO 3
1889 Mission St.

● BROWN INSTRUMENT CO. has established permanent sales and service representation at 400 Broadway, in Denver, and 437 Atlas Bldg., Salt Lake City, it was announced by William H. Steinkamp, field sales manager of the industrial division of Minneapolis-Honeywell Regulator Co. Donald Larcen has been placed in charge of Denver industrial sales. George Winslow will handle similar duties in Salt Lake City.

● U. S. GRANT SUPPLY CO., Los Angeles, has been appointed distributor in southern California for Whiting food freezers, according to Howard Roberts, vice-president in charge of Whiting's Refrigeration division, Chicago. At the same time he announced that the J. N. Ceazan Co., San Francisco, will be distributor for the freezers in the northern territory.

● H. H. WHITE was recently appointed general manager of the Edward F. Hale Co., San Francisco, succeeding WYMAN HENRY, who returned to the O. A. Sutton Co. White will direct the appliance division of the company in addition to his other duties. His assistant, R. J. LEVESQUE will handle sales promotion and merchandising activities of the appliance division.

● BEN P. DAVIS has been appointed West Coast representative of the Chicago Electric Mfg. Co., according to Stanley M. Ford, vice-president and general sales manager. Davis will direct the company's activity on the coast for the Handyhot and Sterling appliances and fans. His office will be in Los Angeles.

● HOWARD W. GRAVES has joined the Pioneer Appliance Co., San Francisco, as the Sacramento representative. He was formerly associated with California-Fresno Air Conditioning Co. of Sacramento.

● FLUORESCENT FIXTURES OF CALIFORNIA, San Francisco, has opened a new plant in Portland. Manufacturing operations will be handled by John Potts, and sales supervised by Joe Blonder.

● ALLEN A. OLSON is the new Pacific district representative for General Electric wire and cable, according to an announcement by J. O. Dillingham, district manager of construction materials sales.

● H. BENNETT MCDONALD is the new district manager for electric appliance sales, Yale & Towne Mfg. Co. His district includes the coast states and Nevada and Arizona.

● THE J. W. MARSH Co., manufacturers' representative of Los Angeles and San Francisco, has added Charles N. Meyer to its staff. He will cover the northern California area for the company. For the past nine years Meyer has served as manager of the electronics division of Leo J. Meyberg Co., San Francisco.

● LEO R. FROLEN has been added to the staff of the J. N. Ceazan Co. in the capacity of appliance representative in the Fresno area. Prior to his appointment Frolen was active in wholesale and retail distribution of major appliance lines in the lower San Joaquin area.

● TUBBS ELECTRIC Co. Inc., Spokane. wholesale distributor, has announced plans of expansion under which capital stock will be doubled and its floor space tripled, according to Clarence A. Tubbs, president. The company started business at the present location in 1946.

● GIVEN MFG. Co. has announced Peter E. Kassler's appointment as vice-president in charge of sales and Fred R. Kassler's appointment as general sales manager. Both men were previously with Gough Industries in the Youngstown Steel Cabinet division.

● A. C. MONTEITH of Pittsburgh, manager of headquarters engineering and director of education for Westinghouse Electric Corp., visited in the West last month, speaking before electrical engineering students and AIEE sections.

● FRANK B. STEWART has been made assistant manager of the San Francisco district of the United States Steel Supply Co., warehouse subsidiary of United States Steel Corp., it was announced recently.

● S & C ELECTRIC Co., Chicago, has announced that Charles E. Klaus, Portland, has been named a sales correspondent for the company. His territory will include western Montana.

● TRI-STATE SUPPLY Corp., Los Angeles, has been named a West Coast distributor for Anaconda magnet wire, according to A. H. Howard, Tri-State sales manager.

● THE CARTER'S ELECTRIC Shop at Rosalia, Wash., has reopened after completing extensive alterations.

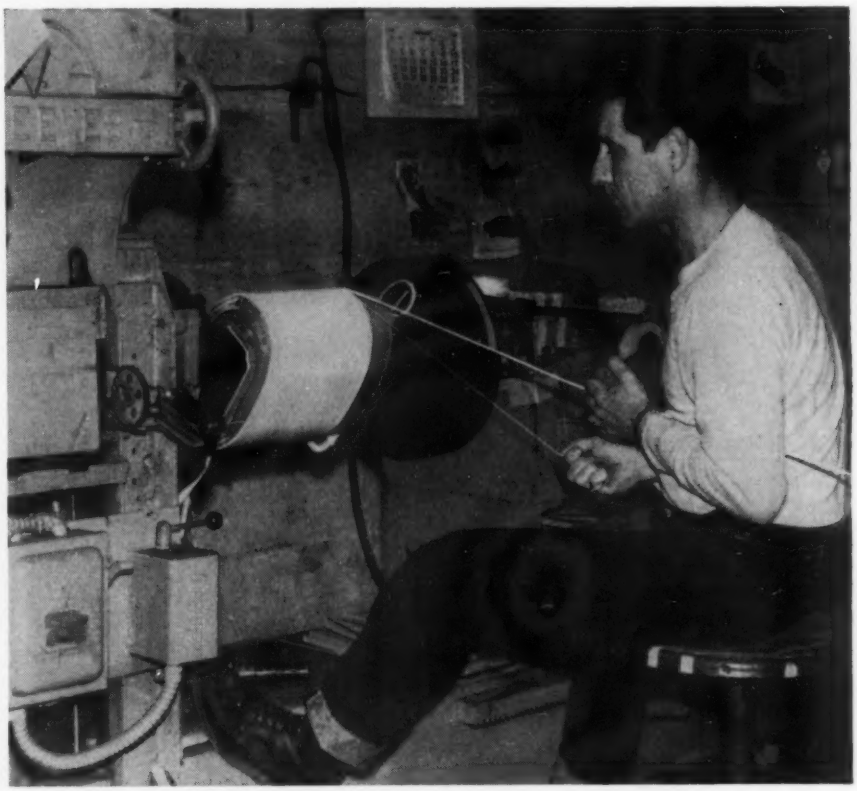
● ERNEST F. HAUCK Co., manufacturers representative, has moved its offices to 324 Fifth St., San Francisco.

● GENERAL CONTRACT for the construction of the new $2 million General Electric motor plant in San Jose has been awarded to Parker, Steffens & Pearce, San Francisco, John Hood, manager of G-E's Oakland works, has announced.

● THE ATOMIC ENERGY COMMISSION has ordered $467,000 worth of electric motors from the Westinghouse Electric Corp. The motors are to be used at the Hanford, Wash., plant where atomic energy studies are under way. Ranging in size from 60 to 1,000 hp., most of the motors will be built at the new Westinghouse plant in Sunnyvale, Calif.

● AL GAREY, who since 1934 has been San Francisco district manager for U. S. Motors Co., has returned to Los Angeles, where he is Los Angeles sales manager. J. E. Hermann succeeds him as San Francisco district manager.

● WESTINGHOUSE ELECTRIC SUPPLY Co., Tacoma, Wash., has moved its offices from 1115 A St. to 1930 Pacific Ave.



Both the coil design and the actual winding of every Gardner transformer hold flux leakages and other losses to a minimum. Gardner engineers and the men who work under their direction never lose sight of the basic necessities of efficient transformer operation. A Gardner transformer is always built to so nearly as possible give power output equal to power input. Gardner Transformers Guard Profits.

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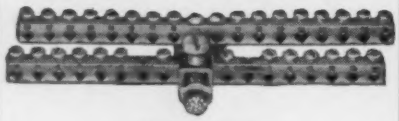

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Bought and Sold
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ROCHESTER 1, N. Y.

● ELECTRICAL MEN of the Pacific Northwest gathered at the Benson Hotel in Portland recently to attend a party sponsored by Gilbert Bros. Inc., Portland, and Globe Lighting Products. Joe Grossman, manager of Gilbert's lighting fixture division, introduced Murray Rosenbloom, Globe's West Coast manager, who presented his company's products.

● STERLING ELECTRIC MOTORS Inc., Los Angeles, recently concluded a five-day annual international sales conference with sales and manufacturing executives of the company's domestic and foreign district offices and plants. The firm introduced its line of electric power drives and announced its sales promotion program for 1948.

● HANS E. HANSEN, sales representative of the Washington division of Columbia Steel Co., has retired from the company, according to M. H. Freedman, division manager. Hansen has been associated with subsidiaries of United States Steel Corp. for 35 years.

● WILSON WELDER and METALS Co. Inc., manufacturers of arc welding machines and electrodes, has appointed the Industrial Air Products Co. as its exclusive electrode distributor in the state of Oregon. Main office of this distributor is at 3200 N.W. Yeon Ave., Portland 10.

● SAN FRANCISCO sales office and manufacturing plant of Cutler-Hammer Inc. has been moved to a new location at 2130 Third St. J. M. Cook is San Francisco district sales manager.

● TRIANGLE ELECTRIC SUPPLY Co. Inc., El Paso, Texas, has been named wholesale distributor for Electromaster Inc., manufacturer of electric ranges. The new distributor's territory includes Texas, New Mexico and Arizona.

● T. W. MILLIGAN has been appointed a West Coast representative for the Pyle-National Co. of Chicago. He will join W. T. BRETHERTON in the company's offices in San Francisco.

● H. H. BULLEN has been named to the newly created position of manager of Western district electrical product sales for the American Steel & Wire Co. His territory covers 14 states.

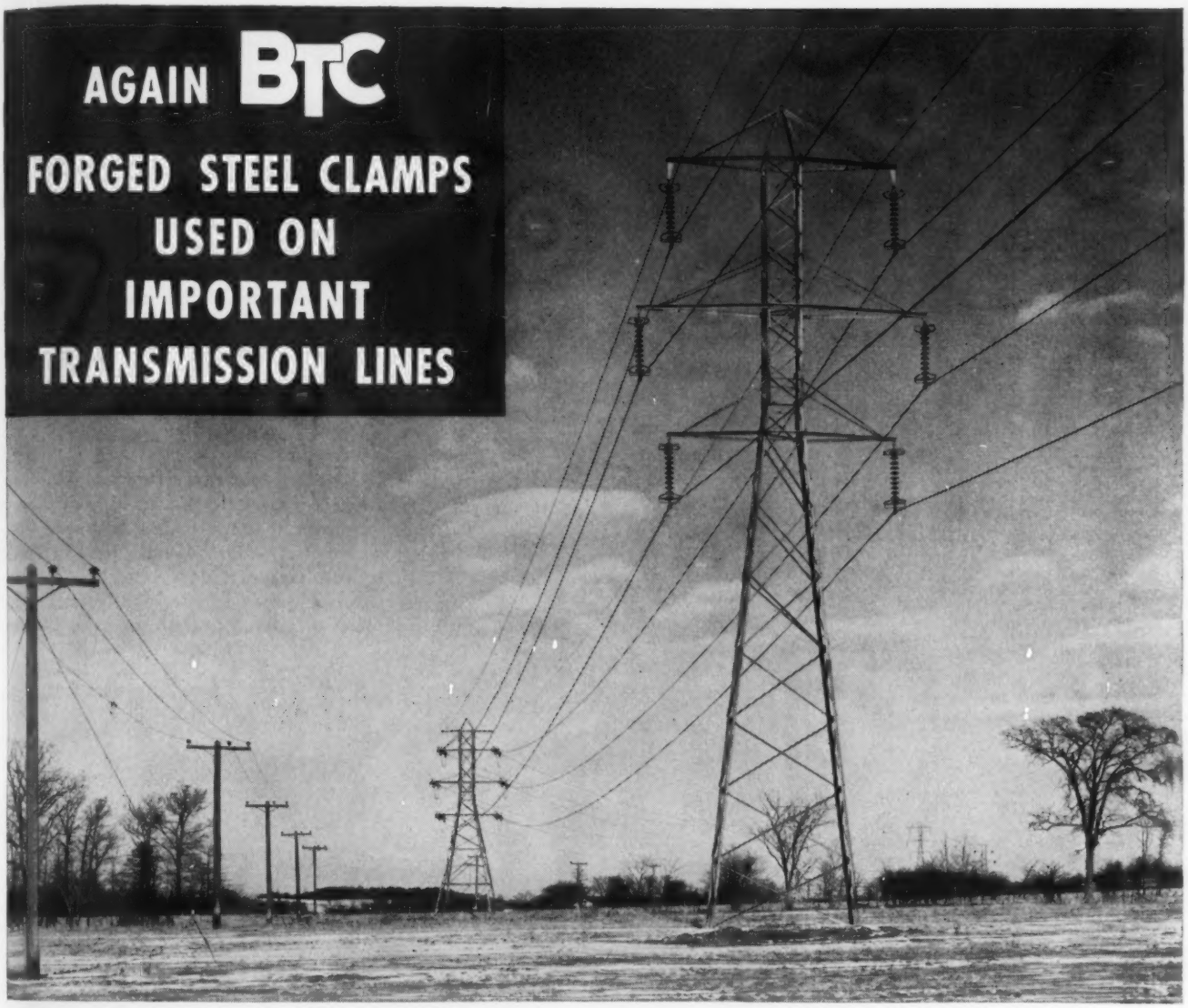
● HERBERT K. NOCK, sales manager of the Smithcraft Lighting Division, recently toured the West Coast and conducted several meetings before electrical groups. He was scheduled to speak in San Diego, Los Angeles, San Francisco, Portland and Seattle.

Lenihan

● JOSEPH C. PLATT, manufacturers' representative in the Pacific Northwest with offices in the Fourth Avenue Building, recently added to his staff two navy officer veterans, engineer trained. They are Harley A. Payne, who covers the Seattle, Tacoma, Yakima and Spokane territory, and Emmett G. Lenihan, who makes his home in Portland, and covers the Oregon area. The company has now become incorporated, Joe Platt, well known as former Hotpoint representative, being the president. Payne is vice-president. The company represents Telechron and Mitchell Mfg. Co. and other lines.

Payne

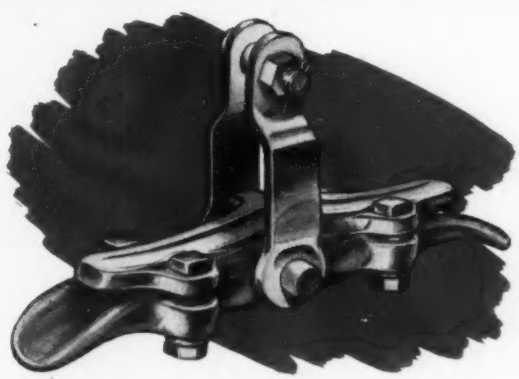
AGAIN BTC FORGED STEEL CLAMPS USED ON IMPORTANT TRANSMISSION LINES



View of Greenbush-Pleasant Valley Line showing semiflexible "A" frames and square strain tower.

In order to join the Niagara-Hudson system with New York City, the New York Power and Light Corporation constructed a 64-mile tie-line from Greenbush, N. Y. (southeast of Albany) to Pleasant Valley, N. Y. (east of Poughkeepsie). Built in 1931, this 110 kv. line features double circuit galvanized steel semiflexible suspension structures and square strain towers. The power conductors are 605,000 cm. 26/7 A.C.S.R. using armor rods; ground wires are two ½" diameter, extra high strength, 7-strand Copperweld.

Controlled-slip forged steel Suspension Clamps produced by BTC are used throughout this line on the power conductors. BTC Forged Steel Caps are also used on the Suspension Insulators. BTC Forged Steel Line Hardware is selected for important transmission lines because of correct design features and economy in maintenance.



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PROFILES

Sam Hayes (seated right), well-known NBC newscaster, recently spoke before the Los Angeles Electric Club. President Sam Scott, Graybar assistant manager, looks on as Chairman of the Day H. J. "Duke" Wheeler asks Mr. Hayes a weighty question

Below, officers of Northern California Chapter, National Electrical Contractors Assn. elected recently: Ray Carey, chapter manager; Dan Bronson, Oakland, governor; Cecil Searle, Santa Cruz, vice-president, and A. S. Henderson, Fresno, president, succeeding Bronson. Each branch has own officers

Coalition group (below) elected as officers of San Francisco Electrical Contractors Assn. at its annual meeting: Ed Scott, secretary; Victor Lemoge, vice-president; W. B. Baker, president and Ed Dowd, re-elected the treasurer

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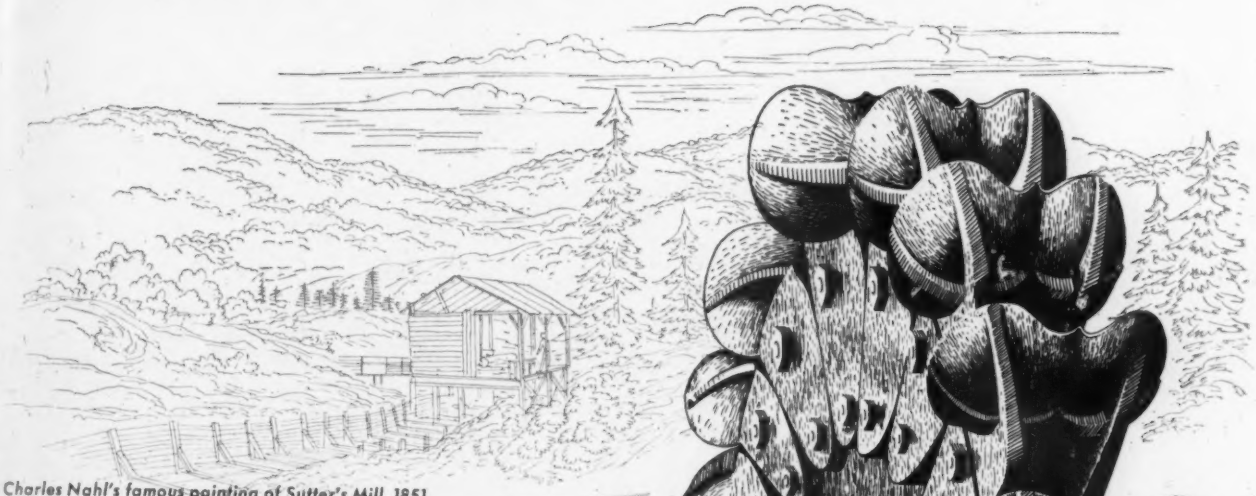

From Charles Nahl's famous painting of Sutter's Mill, 1851
(Courtesy of Society of California Pioneers)

100 YEARS of PROGRESS in WATER POWER

SUTTER'S SAWMILL is the symbol of an epochal event in the history of California and the Nation—James W. Marshall's discovery of gold at Coloma on January 24, 1848. California's early growth and prosperity stemmed from this event. And here was one of the earliest developments of the water power which, applied to electric generators, turns the wheels of industry today.

At Sutter's sawmill a small, wooden flutterwheel was fed by a plank flume 10 feet wide by 50 feet long to drive an upright saw through sugar pine logs. Fascinated Indians watched the saw go up and down and said, "Bueno, bueno".

Today in the high Sierra above Coloma, along the Mokelumne, Feather and Yuba rivers, Pacific Gas and Electric Company is rushing construction of five great hydro-electric plants at a cost of 85 million dollars. Here batteries of giant steel water wheels will spin generators to produce 464,000 horsepower of electricity.

Here again is foresight and water power teamed up to make life and work better in California by producing an abundance of electricity at low cost and delivering it to the people by a service that we hope will always merit a sincere "bueno".

One of six 33,300 pound water wheels now being installed in the Electra Powerhouse on the Mokelumne River. 43,000 feet of 12 by 15½ foot tunnel will bring water to the new powerhouse. This new plant with a capacity of 133,000 horsepower is scheduled to be in operation this summer.

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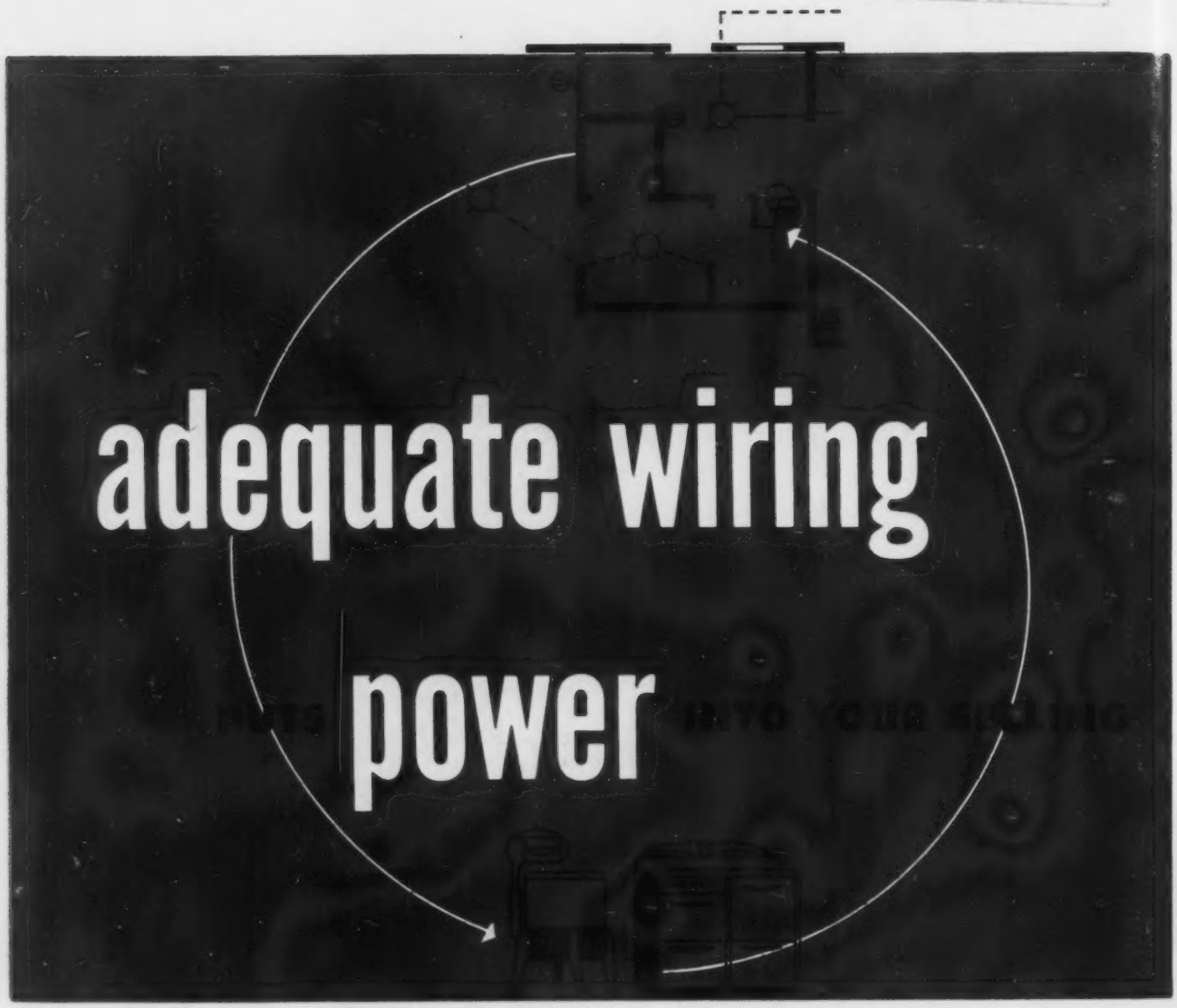

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Adequate wiring, providing plenty of power at every outlet, keeps appliances operating efficiently. Looking to the future, it will stimulate the use of new and improved appliances.

So every home equipped with adequate wiring is a better prospect for the things you have to sell today, and those you will offer tomorrow.

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